Dry Land Farming - An Economic Analysis

(With Special Reference To Banda District, U.P.)

1999

A Thesis Submitted

For the

Doctor of Philosophy

(in Economics)

Bundelkhand University, Jhansi

Under the supervision of

Dr. Vijaya Singh Chauhan

Pt. Jawahar Lal Nehru P.G. College, Banda

By

Miss Nandita Chauhan

I dedicate this work of mine

to

My dear parent

Reverened father (Late) Shri D.S. Chauhan, D.G.C.

&

Respected mother (Late) Smt. S. Chauhan

They inspired

and

encouraged me to have

their dream realised.

Now by the grace of God

I have been able to

complete this work of

mine in the shape

of this thesis

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CERTIFICATE

Certified that the thesis presented under the title "Dry Land farming- An Economic Analysis"- (with special Reference to Banda District, U.P.) is the original work done by Miss Nandita Chauhan. It has been conducted and completed under my supervision. Considering it suitable for the degree of Ph.D. in Economic, in respects of the Content, the systematic conduct and literary form, she is advised to submit it to the university of Bundelkhand, Jhansi for assessment.

V.S. Chauhan

(Vijay Singh Chauhan)

PREFACE

The existence of a substantial and developed agricultural sector is a precondition for the general Economic development of a country. The level of efficiency and productivity in agriculture determines more or less the efficiency of economy. Agriculture forms the backbone of Indian economy despite the concerted industrialization. During the plan period, agriculture still occupies a place of pride.

Uttar Pradesh is a thickly populated state of India consisting of twelve divisions. Jhansi is one of them. It is comprising of seven district- Jhansi, Lalitpur, Jalaun, Hamirpur, Banda, Mahoba and Chitrakoot.

Jhansi and Chitrakoot commissionaries are very backward in comparison to other commissionaries of U.P. Banda district, where the present study has been performed is a constituent of Chitrkoot Dham commissionary and shows clear picture of backwardness. The cultural odds, poor income of inhabited labourers, low level of employment, poor expansion of industries, lack

of irrigating facilities and illiteracy etc. are such conditions that attracted me to work on "Dry Land farming" because the main stay agriculture is rainfed.

This study will impress the researchers and planners, the government and farmers to settle down infrastructure, so as to determine and to enhance the agricultural production as a whole. The basic remedies both on farmers level and on government level that the district needs, have also been suggested within the frame work.

The work is entitled as "Dry Land farming- with special reference to Banda district U.P." and is supplicated as a thesis to the university of Bundelkhand for Ph.D. in Economics.

No research attempt can be carried out singularly. The scholars, institution and other knowledgable persons assistance is always required. The present study is not exception to it, and in this context, I express my profound sense of gratitude to my supervisor Dr. Vijaya Singh Chauhan, reader in the Department of Economic in Pt. Jawahar Lal Nehru Post Graduate College, Banda who supervised and encouraged me at every stage of the work. I am particularly indebted to his timely assistance without his support, perhaps, I could not have completed this study. I am very much thankful to Dr. S.K. Tripathi, Head, Deptt. of Enonomics, Dr. R.P. Srivastava and Dr. R.K. Saxena both esteemed faculty members of Pt. J.N. Degree College, Banda for their help and guidance they offered and when requested. It would not have been possible to conduct the present study without active help of the librarians Mr. J.P. Singh, Mr. R.C. Pandey and Mr. P.N. Dixit of Pt. J.N. P.G. College, Banda.

Invaluable reading material was provided also by District library and Agriculture Degree College, Banda. Important statistical Data were provided by Mr. R.B. Singh of statistical office of Banda.

These prefatory remarks can not be closed if I did not accord my deep sense of gratitude and indebtedness to Mr. Prabhat Kumar Chhattriya. I can not forget to thank Mrs. Chitra Prabhat Chattriya, Asstt. Professor in Political Science, Govt. Degree College, Pawai Distt. Panna (M.P.) and Mr. Vipin Kumar Jain, Professor in English, Govt. Degree College Ajaigarh (Panna) M.P. to encourage and support me to carry on my work. I can not miss the opportunity of expressing my sincere thanks to those ones who inspired me to uphold my task of its completion as per reference to Shree B.L. Pathak, Principal Govt. Degree College, Ajaigarh (M.P.) along with Dr. A.K. Sinha, Mrs. Pushpa Samvedi, Dr. Sanmat Kumar Jain and Mr. R.C. Richhariya of the same college.

I take this opportunity to express my admiration to Mr. Jaideep Singh Chauhan, Mr. Sudeep Singh Chauhan (brothers) & Mr. Shiv Vijaya Singh (Jija ji).Mrs. Vandita Singh (Sister) and friends Mr.Arvind Singh, Km. Darshana, Sapna for their moral boosting in completing the work.

Though labour pays and efforts help, no important work can be accomplished without the blessings and inspirations of elders. While my father inspired me to work for the present research, and my mother infused in me the courage to bear the hardships on my way to the accomplishment of this work, it is my venerable Buaji (Km. Kamala Chauhan) who stood with me in moments of frustration and without whose patronage my parents'

dream could not have been realized.

Last but not least, I am grateful to all those whose names could not be mentioned above for constraint of space. I submit the present work having deep rooted faith in God the Almighty.

Chauhan

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Chapter - I

Introduction

(i) Selection of the problem- General discussion

Agriculture is India's largest and broadest industry. The first and foremost measure of the place of agriculture in the Indian Economy is well reflected in the large income that flows out of this sector. It is very substantial amount from 50 percent to 60 percent. Yet another crucial part in respect of providing work and jobs to the people of Indian agriculture gets on top position.

It is increasingly becoming evident that the entire success of our planning to usher into a self sustaining economy depends on the country's ability to feed the every increasing population and to meet the growing requirements of domestic industries and the export market. The most important lesson which 20 years of planning offers us is, that the property of the country, entirely hangs on the prosperity of the agricultural sector. An efficient and developing agriculture would be a major factor in accelerating the pace of economic development. If agriculture stagnates, it will act not only as a brake on industrial expansion but also hamper real growth. An American economist has also

expressed the view that irrespective of whatever success India might achieve on the industrial front and in solving the balance of payment problem, its economic progress would depend largely on the development of agriculture.

Dr. B.R. Sen, former Director General of the United Nations Food and Agricultural Organisation has also expressed the same point of view as under :

"Agriculture .is the natural base for the overall advancement of the majority of the developing countries and the industry is based on agriculture, a natural stepping stone towards industrial development on a larger scale."

It is quite patent that agricultural sector of our economy needs careful handling and planned stimulation as otherwise it can arrest the development of the entire economy. The importance of agriculture in the country's economy has been highlighted by the Planning Commission in the following words :-

"The pace of development in the agricultural sector sets a limit to the growth of industry of export and of the economy as a whole and constitutes a major condition for achieving economic and social stability and improving the levels of living and nutrition for the mass of the people."

It is obvious that there is hardly any possibility of substantial increase in the area of cultivation which appears to be the only way to boost agricultural production. In this connection professor Nicholas writes "Despite relative scarcity of land, India has tremendous opportunities for increasing yield per acre by modest capital expenditure on land saving techniques and a fuller utilisation of her abundant agriculture labour force."

Agriculture is an important industry like other industries. It also requires capital due to the peculiarities of agriculture, specially its uncertainties, its small unit

production, scattered operation, low returns, high rates of rent and limited scope of employment. A large section of cultivators can not manage from one harvest to another without recourse to borrowings.

For stimulating the tempo of agricultural production, it is imperative that the farmers must be provided with essential prerequisites like fertilizers improved seeds, irrigation facilities, modern implements, marketing facilities etc. It is obvious that without adequate and timely credit, they would not be able to make use of these essential inputs. Therefore, it is justified in the words of Lord Mayo that :

"For generations to come the progress of wealth and civilization must be dependent on her progress in agriculture. There is perhaps no country in the would in which the state has no immediate and direct interest in agriculture. The government of India is not only a government but the chief landlord."

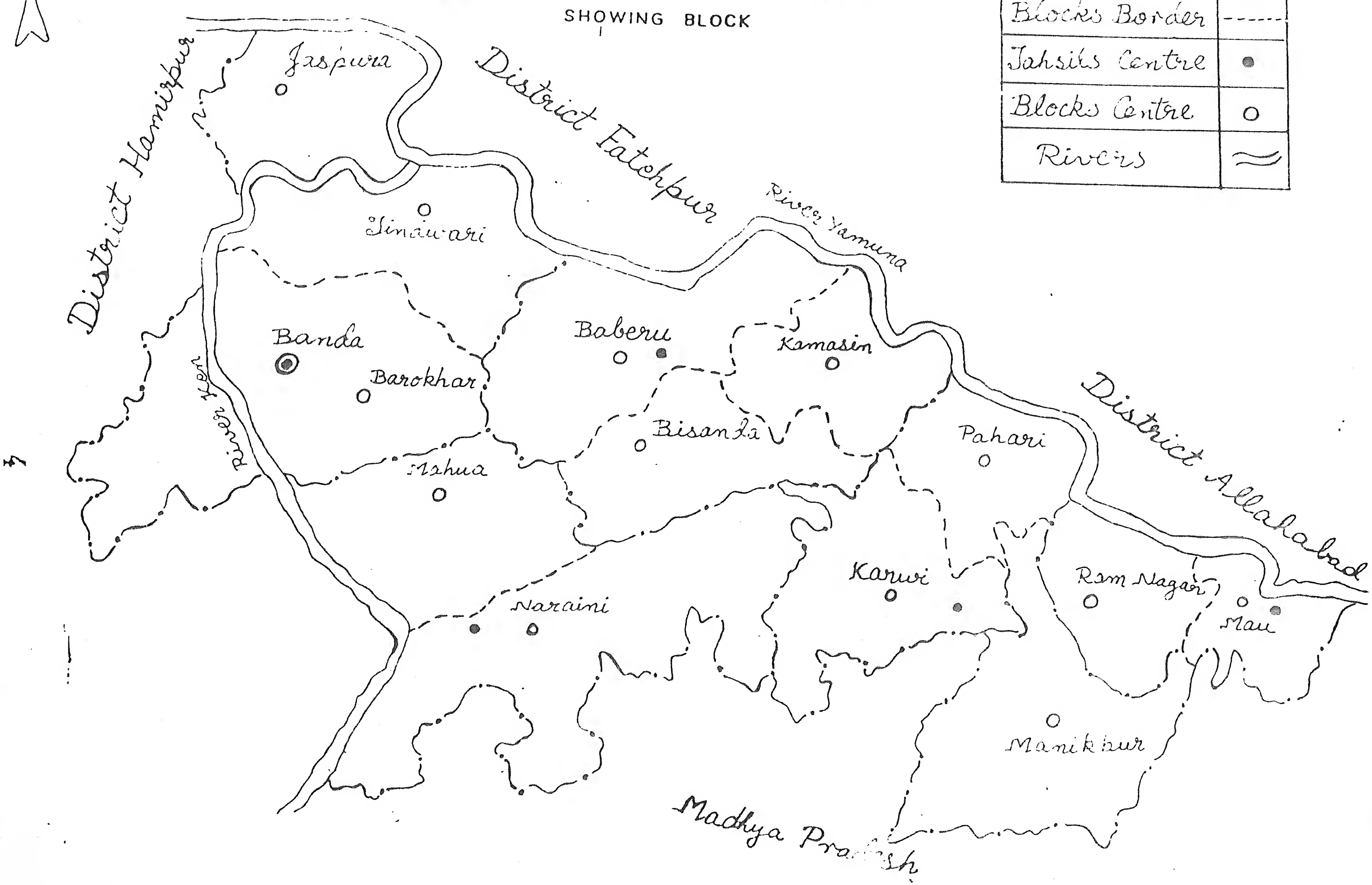
This is why it has been truly said by the Administrative Committee on agriculture :

"............... it is agriculture that is the mother of all industries and the maintainer of human life."

The dry farming is an important phenomenon of the district's rural economy as it would be observed in the foregoing chapter. The farmers have generally adopted the crops which have drought resistance character e.g. gram, wheat, arhar, linseed, lentil etc. The gram, linseed, wheat and lentil have emerged as special and commercial crops as they bear low cost and profile good return. That is why, the proposed study "Dry Land Farming- An Economic Analysis in Banda District" may be beneficial to the farmers and significant to those who plan and think for agricultural development. An interesting clue may be visualised specially

MAP OF DISTRICT BANDA

SHOWING BLOCK



for such places where dry farming is obvious.

(ii) General Features :

Agricultural Economy of Banda District

1) Location

Banda is one of the seven districts of Jhansi Division generally known as Bundelkhand Region of U.P. A large part of this region is drought prone and in some place even drinking water is not available in summers due to the drying up of drinking water wells. Therefore, the state government has made arrangement to supply piped water in Banda district to construct tanks for storage of water at Karwi under "Patha Jalkal Yojna" to drought prone area of Mau and Karwi Tahsils of this district.

The district is situated in the eastern part of Jhansi division and lies between 25-53 N and 25-55 N latitudes and between 80-07 E and 81-34 E longitude. On the north its boundary is Fatehpur district, while on its south lies the districts Chhatarpur, Panna and Satna of Madhya Pradesh. Allahabad district joins its eastern boundary and Hamirpur district joins the western boundary. As a matter of fact river Yamuna forms its northern boundary separating it from Fatehpur district (Map of the district is attached).

2) Physical Features

The district of Banda is clearly divided into two natural parts viz., Patha and Alluvial land. The former is a part of Vindhya Plateau covering Mau and Karwi subdivisions of the district. It is rocky and covered with forests, bushes, grasses and is drought prone. The agriculture in this pastoral type. Patha area consists of the following blocks:

a) Mau

b) Ram Nagar

c) Pahari

d) Manikpur, and

e) Chitrakoot

The latter part of the district is fertile alluvial plain in the northern part of the district. It comprises of the following blocks :

a) Badokhar Khurd

b) Mahua

c) Jaspura

d) Tindwari

e) Naraini

f) Bisanda

g) Baberu, and

h) Kamasin

The second part of the district can further be subdivided into two parts. The first area being in the valley and at the foot of hills of the Vindhyan hills and second subdivision is between rivers viz., Bagin, Yamuna, Ken and Chandra. General slope of the area is south to North and number of rivers flow through this part and join river Yamuna at different places.

The expansion of Banda district from east to west is 147 kms. and from north to south 104 Kms. in length which is spread from east Bargarh to West of Mataundh and in North from Chandwara and in south upto Kalinjar. Banda district is situated between river Yamuna and range of Vindhyanchal mountains Leaving apart, part of it the rest part is high and low, stony and covered with forests. Its slope is from east to west.

According to physical features the district can be divided into four parts :

a) Western part near River Ken :

It includes the near by area of Ken and plane area towards west. Black soil is found here which is supposed superior for produce and fertility. This part covers maximum

part of Banda Tahsil.

b) Plane land of Middle :

This part consists of two tahsils- Naraini and Baberu. This part is mostly plane and even. As the ground is plane here, it is irrigated by canals. As the means of irrigation are available, the production of paddy is done on a large scale.

c) The plane of Gunta and Bagen :

The river Mandakini flows through this part. This part includes some part of Naraini, Karwi and Mau Tahsils. This area is covered with forests and is drought prone. Therefore this area is not fertile from agricultural point of view. The crop of this place is of low class. This is better for pasture than for agriculture.

d) The South and Eastern part of Plateau :

This part can be called "Vanasthali." Here is found the chain of Vindhyachal mountains. The soil here is stony due to it being a hilly area. The ground is not fit for agriculture. Thorny bushes are found here and the ground is uneven. This is higher than other parts. It includes some part of the Mau and Karwi Tahsil.

3. Administrative and Development Divisions :

This district administratively is divided into following subdivision :

a) Banda

b) Baberu

c) Naraini

d) Karwi, and

e) Mau

For purposes of development the district has been divided into 13 development blocks as under :

a) Banda   i) Jaspura

ii) Tindwari

		iii)	Barokhar Khurd
b)	Baberu	i)	Baberu
		ii)	Bisanda
		iii)	Kamasin
c)	Naraini	i)	Naraini
		ii)	Mahua
d)	Karwi	i)	Pahari
		ii)	Manikpur
		iii)	Chitrakoot
e)	Mau	i)	Mau
		ii)	Ram Nagar

4) Social Features :

The population of Banda is 1865139 lacs. Out of which the number of literate is 528217 lacs. It is clear that number of literate is one third of the total population. The number of literate women is much less. Banda district is very backward in comparison to other districts of Uttar Pradesh due to want of education.

The main occupation of the inhabitants of the district is agriculture. About 71% of the total population lives in villages and 13% in urban area. In the district, specially in rural area, the social evils and economic inequality exist in its climax. The main reasons are inequality in the distribution of land, lack of the means of irrigation, social inequality and their dependence on agriculture for their livelihood, besides this-illiteracy, unemployment, untouchability, anarchy in society, blind faith, the old traditional religious and social inequalities are present in their crudest forms. All these general factors are prevalent in the whole district. Two main reasons are responsible for the above evils :

a) Lack of literacy in the district,

b) Inequality in the distribution of land

According to UNESCO only Basic Education (Social education and Adult education) is the only means of upliftment of man's emotional intellectual, moral and materialistic fronts. Due to the illiteracy prevailing in the rural area, the rich exploit the poor farmers. The allied people are becoming more rich having abundant means and the depressed class, carrying less of no means, is becoming poorer. The disparity is increasing day by day between the rich and depressed class. In the district in 1990-91 only 35% of the whole population was literate and the rest 65% still illiterate.

The problem of drinking water in the district is very serious. The patha area of manikpur block is highly affected by this problem. The 'Kols' of patha area are living in pitiable condition for the last many decades. Though the loan has been received from the world bank to make the drinking water available to this area, the government did not take solid steps to get rid of the problem of drinking water. Upto the year 1994-95, 474 handpumps have been installed in all, but 1201 inhabited villages still remain a prey to this problem. Most of the villages in the district are using drinking water from the wells as there are only two handpumps, that are not sufficient for the supply of drinking water.

Banda district is very backward in comparison to other districts of U.P. The social customs and culture prevalent in this district are different from those of other districts of the state in comparison to other districts of Uttar Pradesh the language and standard of living of people simultaneously is very different and low.

The main occupation of district is agriculture. Most of the people of this village depend on this occupation. They are poorer and have no other means of income so most

the people lead a very simple and hard life. Mostly they wear trouser and kurta or 'Dhoti and Kurta.' Backwardness of this district becomes more evident due to the Fact that the inhabitants of this district, specially of rural area carry "Lathi and gun" in their hands. They feel proud in having gun with them and the society also looks upon them as very respectable persons whereas there is no such system in other districts of U.P. and if by the way such system is found in any district, the people do not hesitate to call them uncivilized.

One more special feature of this district is that men and women both eat betel nut, betel leaf and tobacco equally. They have become habituated to use these things. The main reason of this is illiteracy prevailing in this district.

Child labour and women labour occupy main place. The child labour engaged in agricultural work is on the top in U.P. whereas women labour holds the second position. Most of the activities connected with agricultural work are done by women because the men spend their time mostly in bad activities; in gossips in gambling and in drinking etc. The standard of life of most of the population of this district is very simple while others live below the poverty line.

Besides this, the population is fast increasing in rural areas. In 1901 the whole population of the district was 619186 lacs, but it reached the number of 1622718 lacs in 1991. All the attempts of family planning seem to be useless. The main reason behind this is illiteracy and hence the lack of civic sense.

5. Economy :

On the basis of geographical and economical configuration, the state is divided into regions. Bundelkhand itself is the economic region among other economic regions of U.P.

All the seven districts of this region are counted in the backward category. This region is treated as backward from economic point of view.

Banda is most backward and makes the whole of backwardness within the whole of backwardness. The economy of this district depends mainly on agriculture. The land is sloppy and stony one and gives poor yield per hectare. The small and medium sized farmers, who are large in number are unable to arrange short means of irrigation. The agriculture depends mainly on rainfall which is uncertain.

In the district in 1995 the daily wages of the agricultural labour was Rs. 35/- which is much less for them to make both ends meet. But these labourers got employment only for 189 days in a year and remained unemployed for the rest of the year. Besides this, in the agriculture sector, workers are employed in more than required number. In this way, in the district, seasonal unemployment and disguised employment are prevailing. Due to the meagre income both their consumption and savings are less. There is no effective demand due to less consumption. This is why means of production are not fully utilised and as result of this, investment is discouraged.

The percentage of industries is 1% to 2% in this district in comparison to U.P. as a whole. There are only two big industries in the district. First the spinning mill in Banda and second the glass factory in Bargarh, which is unfortunately paralysed due to financial incapability. Besides this agro based industries such as Dal Mills, Rice Mills and cottage industries like oil crushing cum atta chakki, biri making, bamboo basket making, shoe making and wooden industry of Chitrakoot all these should be encouraged so that the per capital income may increase and standard of living of people may be improved.

Table No. 1.1

Comparative Account of the rainfall (in mm)

Year	June	July	August	September
1	2	3	4	5
1982	23.02	30.17	431.08	52.01
1983	83.06	256.00	126.07	213.00
1984	44.06	188.05	12.00	119.06
1985	55.07	32.24	172.06	192.00
1986	108.01	235.08	309.00	138.07
1987	0.10	83.04	138.00	150.00
1988	127.00	192.00	304.00	100.00
1989	155.00	117.00	158.00	117.00
1990	92.06	453.00	367.30	192.82
1991	107.03	141.09	398.40	149.20
1992	11.38	202.40	330.80	375.89
1993	38.38	100.48	202.40	379.38
1994	118.54	343.81	293.31	81.04
1995	30.78	232.92	474.98	134.24
1996	80.55	125.15	356.22	106.80
1997	85.24	132.00	168.20	190.90

Source : Flood Control Security Plan in District Banda, 1998

The natural calamity viz; flood often occurs in the district and causes great loss of economic power damaging and destroying the crops, houses, animals and also human beings.

6. Agricultural Systems

a) Rainfed Agriculture

Indian agriculture is the gambling of monsoon i.e. most parts of land are devoid of irrigating means and its agricultural productions are affected by rains. Banda also illustrates the same picture. The district adopted dry land practice of farming and more attention is paid to growing such crops which need little water. Whenever it rains in winter season the Rabi Crops give better yield otherwise as usual. This is why, the fluctuation in production levels, occurs naturally.

As an evidence in case of Banda, the percentage of irrigated area to total cropped area from 1984-85 to 1994-95 has gone from 20.06. to 28.06. Though the irrigation facilities are increasing yet 75% of the area which is cropped, remains dry. The huge amount of cropped area generally belongs to marginal and semi marginal farmers. Such situation is found in almost all other districts of the region because the geographical topography is almost similar.

b) Lack of Modern techniques :

The main occupation of 80% of the population is agriculture, Banda district is very backward in agriculture sector even today. Old traditional means are adopted in agriculture sector. There is complete lack of modern techniques. Low yields of dryland agriculture are due to the poor quality of and inadequate agricultural inputs, untimely field operations and inefficient crop production technologies adopted. The farmers of this district have been

Table - 1.2
Comparative Account of Flood during the Past Years

Years	1978	1983	1992	1996	1997
Water level of River Ken	110.85	109.00	113.27	108.75	107.85
Water level of River Yamuna	105.66	108.40	101.44	102.62	95.85
Danger Point River Ken	-	104.00	104.00	-	104.00
Danger Point River Yamuna	-	-	100.00	100.00	100.00
Numbers of effected villages	572.00	339.00	588.00	208.00	07.00
Population of effected villages	443216	252559	597485	226704	16794
Numbers of the villages merged in water	80	39	131	189	-
Effected area	317604 (in hect)	103996 (in hect)	213602 (in hect)	43093 (in hect)	1797 (in hect)
Population of the villages merged in water	70494	4420	128131	24401	
Effected cropped area	122	399	55704	74247	29950
Estimated lost	19573080	13926000	12195300	213564	443500
Perfectly destroyed houses	125510	3806	6860	85	-
Partly destroyed houses	14713	2365	6196	575	-
Estimated loss	30936394	11865000	21632590	112896	
Man loss	3	2	35	4	
Animal Loss	72	15	359	26	

Source : Flood Control Security Plan in Banda District-1998

using traditional and outdated farm equipment. These equipment not only perform poorly but also demand a lot of energy and time in production and post harvest operations.

For example even in ploughing with the wooden plough, the ploughman and the bullocks have to walk almost 66km. to complete one operation. This entails drudgery, requires more energy and perpetuates poor quality farm work as compared with the results when improved farm equipment are used. The poor quality and the low quantity of farm output are the handicaps of dryland agriculture. The low level of efficiency in energy utilisation owing to the use of traditional farm equipment is responsible for low productibility. But the rich farmers who have plenty of land or whose economic condition is good, use this technique. It is clear from the above details that the inhabitants of this district are quite ignorant of modern techniques. There are two main reasons for this -

i) Illiteracy among the inhabitants, and

ii) Mostly the Economic condition of the farmers' being poor.

Though the government tires from time to time to give knowledge to the farmers through electronic media to increase the use of fertilizer. Inspite of this their success is doubtful. In this way only a few farmers use fertilizer. In the district the degree of mechanisation is very poor They neither use H.Y.V. of seed nor follow the specifications for the use of pesticides and insecticides. The use of N.P.K. is also poor e.g. the quantum used in Banda district.

Thus, the modernisation in agriculture here, is in irrigation specially very little and medium sized farmers who are large in number are far behind and usually follow the traditional farming.

c) **Dry farming :**

Economic condition of half developed countries depends on agriculture. Water plays important role to carry on agricultural operations easily. The area of Banda district is of dry nature so there is urgent need of water. To attain this aim the supply of water is done by the government tube wells, rivers, tanks canals and wells. The means of irrigation are not satisfactory, due to which the farmers of the district are unable to produce two crops and their farms lie useless for the rest of the time. Besides these two crops if some other crops are produced, they dry up due to improper supply of water. Here such crops are produced which require less water as wheat, gram, oilseeds (Lahi, Sarson, Til). Because of the facility of canal being available the crop of paddy is very good in the Naraini and Mahua block of the district. Thus only one crop is grown.

d) **Agricultural Hazards :**

The barriers in agriculture in the district are either man made or naturally bestowed. In the first category, like other places the agricultural labour is basically unskilled and unorganised and has little for its livelihood other than personal labour and secondly the mentality of work thinking is seen to have disappeared. People in the district lead a lethargic life. Thirdly the agricultural education or learning and adoption of techniques shares very little.

The natural hazards which affect the agricultural productions are :

i) Sloppy and stoney land.

ii) Extreme climate.

iii) Poor water resources.

iv) Dry Land farming-Rainfed agriculture, and

v) Natural checks floods and Droughts.

The above characteristics generally prevail in the district. The farmers accept the above challenges and do farming as its conditions enable and permit them.

iii) Climatic Variations :

Climate of the district is extreme Summers are extremely hot and winters are severe. Summer season starts from the middle of march and lasts till first week of July, then rainy season starts to last by middle of October. Winter season extends from mid of October to mid of March. The hot winds laden with dust, commonly known as 'Loo' blow during summer season of the year. Temperature during summer ranges between 35°c to 50°c, while temperature during winter lowers to 2.8°c December and January are the coldest months of the year in the district.

Monsoon plays ducks and drakes with the district economy. The normal date of Monsoon in the district falls in the third week of June.

i) Rainfall :

Average annual rainfall of the district is 949.51 mm. and as regards the monthly rainfall, it is the maximum in the month of July. The mean monthly rainfall of the district is given in table No. 1.3.

ii) Temperature :

The monsoon plays ducks and drakes with the district economy. The month wise temperature is given in table No. 1.3.

There are fluctuations of extreme nature. The days are hot and nights are cold. May and June months are very hot, while December and January are very cold.

iii) Humidity and Vapour Pressure :

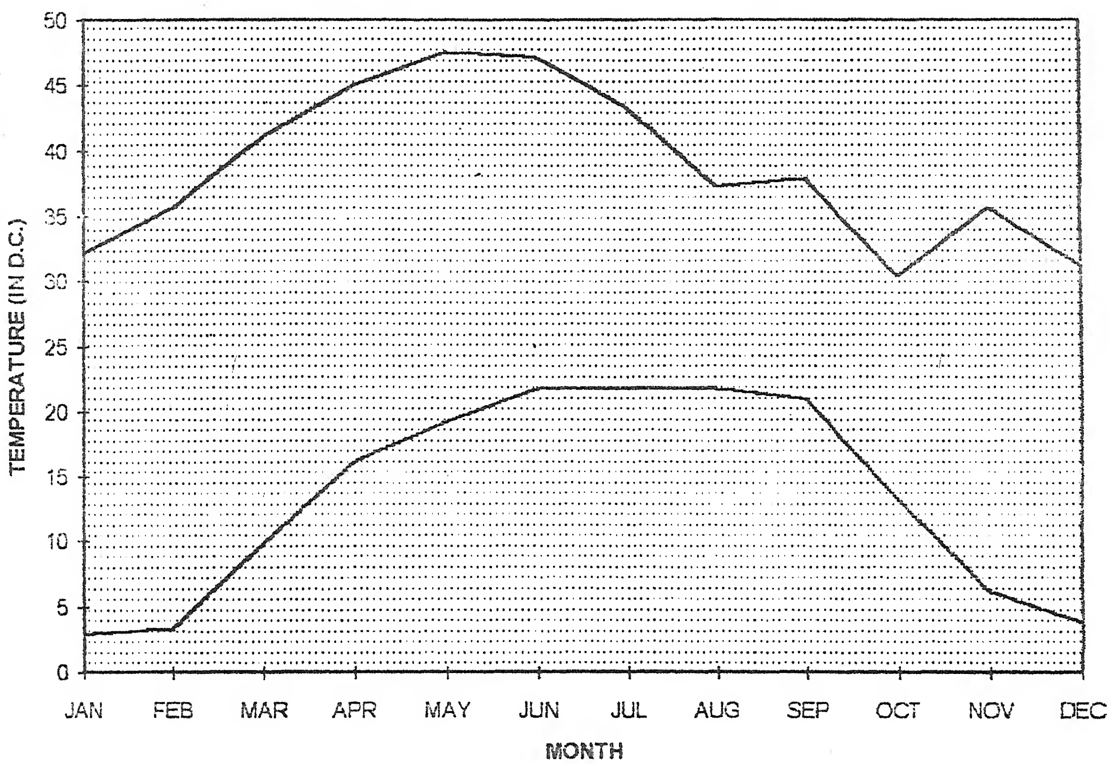
The humidity and vapour pressure in Banda district is of extreme nature. The maximum of it is 86% in the month of August and the minimum of maximum is 33% in the month

Table No. 1.3
Climatic Variation

Month	Temperature (in °c)		Rainfall (in cm.)	Humidity Relative Humidity %		Vapour Pressure (m.b.)	
	Max	Min		Max	Min	Max	Min
1	2	3	4	5	6	7	8
Jan	32.2	2.8	20.86	76%	57%	11.7	13.9
Feb	35.6	3.3	25.84	65%	41%	11.5	12.6
March	41.1	9.8	0.85	48%	31%	13.6	13.4
April	45.0	16.10	.70	35%	23%	14.7	14.9
May	47.6	19.2	0.80	33%	25%	20.3	18.6
June	47.2	21.7	125.22	54%	44%	26.8	26.5
July	43.3	352.81	83%	76%	33.7	34.7	34.5
Aug.	37.2	21.7	305.00	86%	82%	35.2	31.0
Sep.	37.8	20.9	85.40	80%	74%	31.0	32.3
Oct.	30.3	13.2	15.76	69%	59%	23.0	23.6
Nov.	35.6	6.1	4.65	61%	49%	13.5	15.9
Dec.	31.1	3.8	12.78	73%	58%	12.1	15.2
Annual total of or mean	47.8	2.8	949.51	64%	52%	20.4	21.3

Source : Based On Soil Survey & soil work in U.P. 1996-97

TABLE NO. 1.3/A CLIMATIC VARIATION



TABEL NO 1.3/B CLIMATIC VARIATION

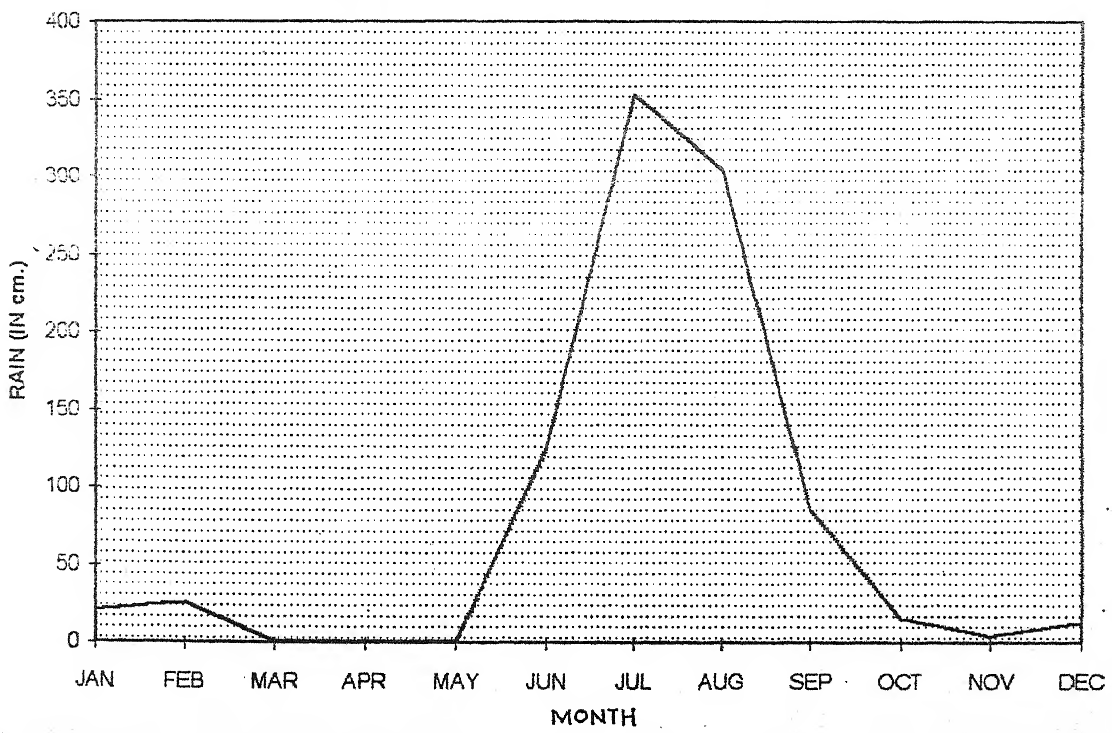
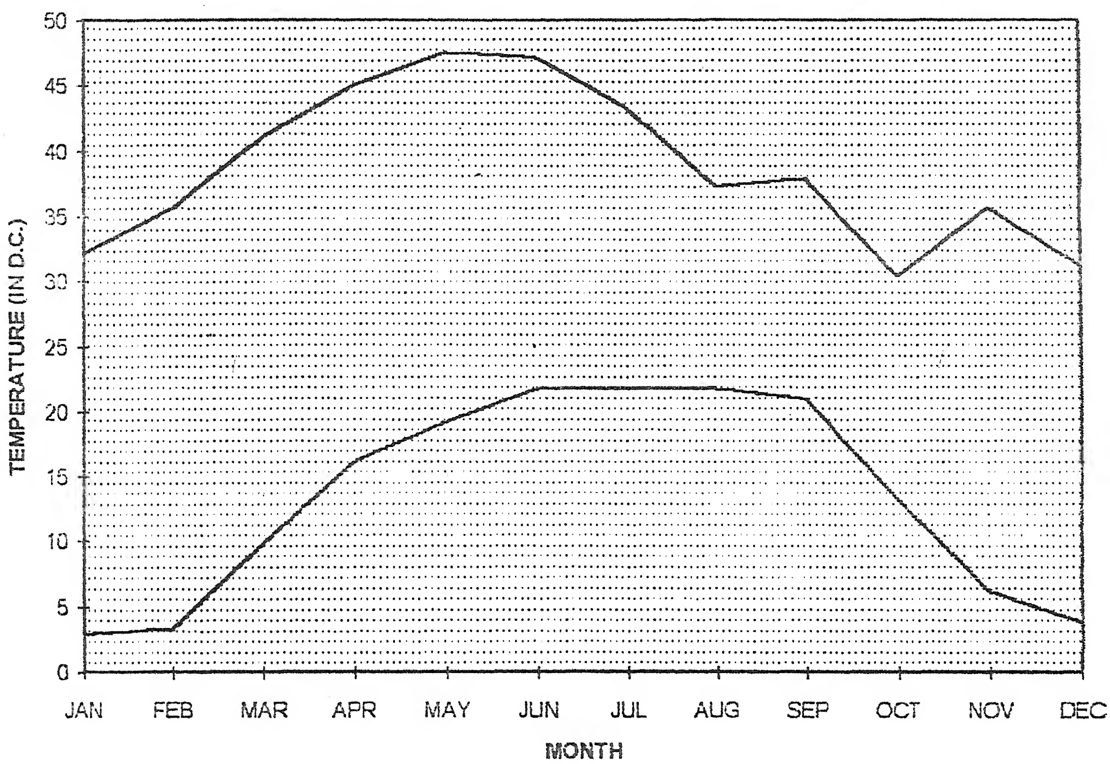


TABLE NO. 1.3/A CLIMATIC VARIATION



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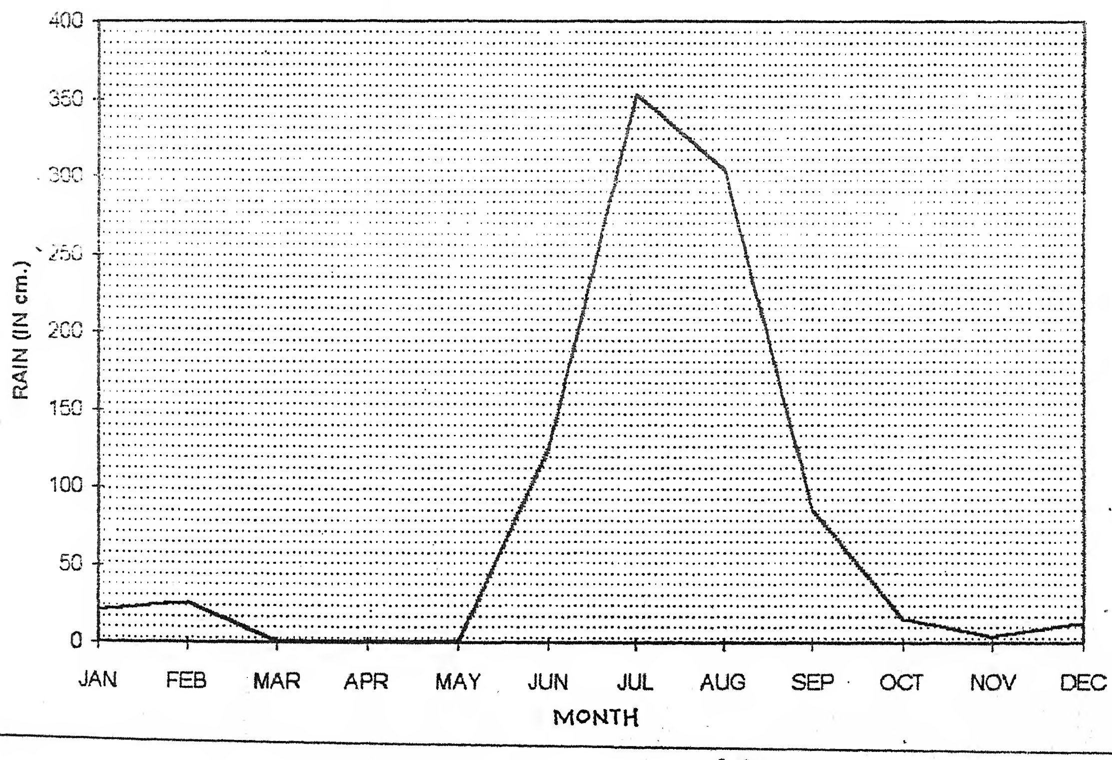

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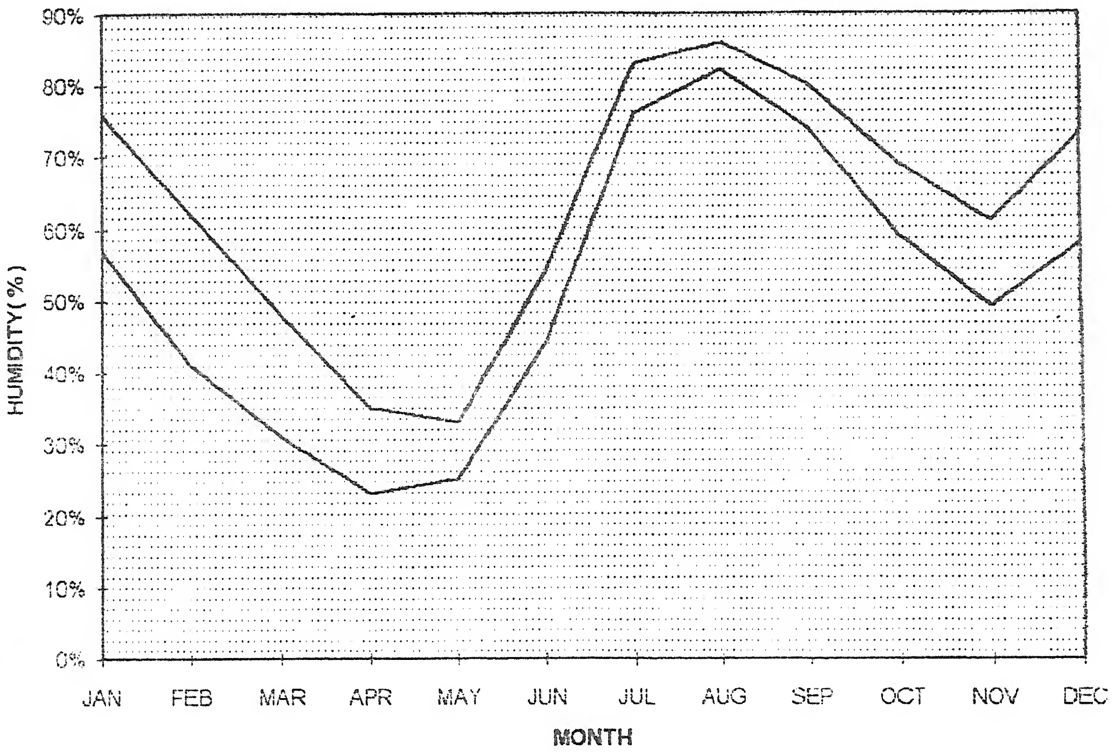
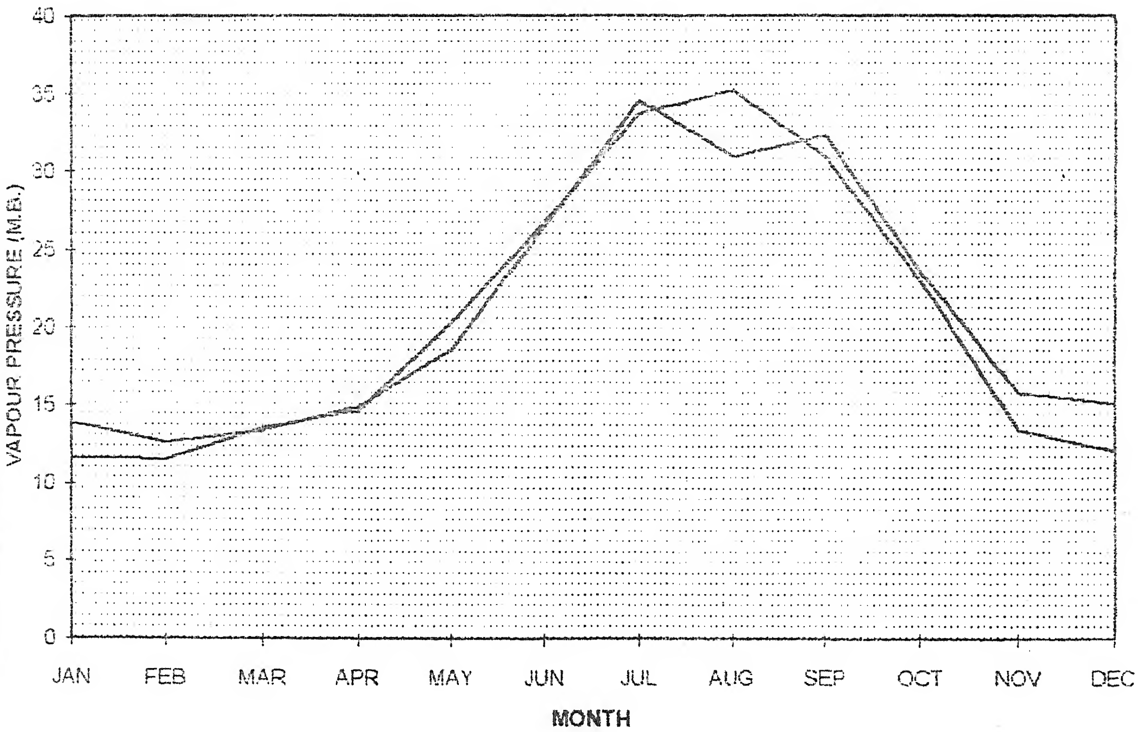


TABLE NO .1.3/D CLIMATIC VARIATION



of May. This shows that there is a vast difference between the two.

The maximum of vapour pressure is 35.2% in the month of August and minimum of the maximum is 11.5% in the month of February.

iv) Review of Literature :

Agriculture is the dominant sector in the Indian economy. It accounts approximately three quarters of the labour force, one half of the national income three quarters of exports (if we include manufactured agricultural products).

Of late dry agriculture has received great attention from planners and scientists on account of the recent advances in agricultural technology. The dry farming areas have been characterised as those areas which receive 40 cm. to 100 cm. of annual rainfall and have less than 25 percent of sown areas under irrigation.

Since the inception of high yielding varieties programme in 1966 it has become a must that immediate steps should be taken to improve the lot of the people of dry farming areas. For, it was felt that any delay would accentuate the wide gap between the income of the farmers of irrigated and non irrigated tracts and ferment social unrest.

One of the side effects of the green revolution being witnessed in some parts the country is the increased concern for the problems of dry farming areas. This is as it should be because large parts of the country falling in arid and semi arid tracts are unable to take direct advantage of the new strategy of agricultural development for which assured water supply is the critical requirement. Besides, they will have to bear with permanently depressed agriculture due to recurrent droughts and famines. On the top of those, paucity of information about their problems and potential hinders evolution of a meaningful development strategy for

such areas. In this context the present study which tries to assess the scope and approach for improving agriculture in the dry areas of Mysore state is a welcome one.

The study is based on intensive investigation of physical (i.e., soil moisture etc.) and economic conditions of two chronically drought affected talukas, viz; Pavagada (Lumkur district) and Bagewadi (Bijapur District) in the dry belt of the state.

On the basis of the study of soils, topography, ground water resource, rainfall and cropping patterns in the two talukas the study has assessed the agricultural potential and has recommended development programmes (separately for two talukas) which focus on (i) extension of irrigation, (ii) adoption of soil conservation measures and (iii) changes in the cropping patterns.

It is observed that the extent of irrigation through exploiting ground water potential can be increased in pavagada from 13 percent of the cropped area at present to 18 percent. In Bagewadi on the other hand not much can be added to the present extent of irrigation (only 3 percent of the cropped area) particularly because of the poor quality of water.

Hence in most parts of the dry areas, conservation of available moisture through contour bunding and its efficient utilization through adopting the cropping pattern to the availability of moisture is the only alternative for improving agriculture. The study recommends a ten year contour bunding programme to cover 90,000 and 1,10,000 hectares in Pavagada and Bagevadi respectively.

To ensure optimum utilization of available moisture, the study suggests intensification of cropping by replacing the existing long duration and low yielding crops by new short duration and high yielding crops in such a way that drought

spell (which normally occurs during mid June to mid August in Pavagade and during July-August in Bagewadi) is escaped, i.e., the drought period coincides with the slack period between two short duration crops.

In all 84 districts in the country are included in the category of dryland farming. Mahindragarh district of Haryana is one of them as the average rainfall in the district is only 60cm. and total irrigated area is only 11.4 percent of the total net sown area. Though the situation is similar in some parts of Gurgaon and Hissar districts of the state, Mahindragarh represents a typical dry farming region and because of this it was selected for the present study.

The green revolution in part of the country has generated confidence for attainment of self sufficiency on the food front in the very near future. With the introduction of High yielding varieties programme not only the productivity per unit of time could substantially be raised through adherence to multiple cropping programme. About 75 percent of the total cropped area in the country is rainfed. Also there exists diversity in the magnitude of rainfall from one area to another. This necessitates that proper attention should be given on examining the resource use efficiency of farmers in rainfed areas. Even in rainfed areas rainfall distribution is uneven.

In 1971, the 31st session of annual conference was held from 27th to 29th Dec. under the auspices of the Banaras Hindu University Varanasi- 5 (U.P.). The subjects for discussion were-

i) Problems of Dry farming

ii) Agricultural Prices : Problems and Policies

iii) Institutional credit for agriculture

The present research in connected only with the problems

of Dry farming and in the conference a number of papers were received concerning the above.

To avoid repetition in discussion and to facilitate critical scrutiny all the papers had been categorised as under :-

i) Papers pertaining to cost benefit analysis of converting dry areas into irrigated areas.

ii) Enterprise diversification in context of instability and growth and, development strategy for arid agriculture.

iii) Crop Insurance

iv) Financial aspects of adoption of dry farming Technology.

v) Problems of yield and income variability.

vi) Relative profitability of crop enterprises under dry and irrigated conditions.

vii) Papers dealing with miscellaneous problems not directly concerned with the agreed scope of the subject matter.

These papers attempt to estimate economic returns from the conversion of dry areas to irrigated areas. In one of these papers, a scholar, A. Sachidanandam estimates costs and returns from canal irrigation system of the Hirakund project which results in a loss to the farmers. H.K. Das Gupta, Prafulla Dass and his co-workers find in yet another paper that per hectare irrigation cost can be substantially reduced by full utilization of irrigation potential. J.P. Bhati, G.R. Singh and K.K. Verma use the extension demonstration date of Budaun district (U.P.) and experimental date on fertilizers only to show that per acre net returns from irrigated fertilized wheat came to be as high as compared to just Rs. 20 from un irrigated unfertilized wheat.

N.S. Jodha and S.D. Purohit properly set forth the problem of crop yield instability and survey the effects of weather variabilities on some major crops in the dry (arid) region of Rajasthan, M.K. Shingarey treats dry area as one which depends on rainfall and uses only yield and price data for a period of five years.

N.S. Krishnaswamy and K.V. Patel identify the variability of the known dry farming technology and estimate the magnitude of finance for its wider adoption. The authors contend that the available dry farming technology meets the viability criterion of simplicity, accept ability and feasibility in terms of input availability and profitability.

M.V. Nadkarni calculates the coefficient of variation for different crops in Maharastra to measure their yield uncertainty. It should be logical to expect that to the extent crop yield variability is due to variation in rainfall, irrigation would not only increase the average yields but also would reduce the year to year variation. B.B. Singh and S.P. Singh find that in Agra district (U.P.) drought resistant crops (bajra, gram, Arhar and oilseeds) command more area in dry than in irrigated farms.

L.R. Singh and U.K. Pandey study the cropping and the resource use efficiency in a dry farming district of Banda (U.P.) Human labour use is found to be excessive and accordingly one fourth reduction in its use is suggested to increase farm incomes by 10.2 percent. Permatma Singh and D.D. Gupta find farmers in the dry farming areas of Haryana State fully acquainted with new crop technology and any log in the dry farming areas of Haryana state fully acquainted with the new crop technology and any log in its adoption is ascribed to be lack of assured irrigation facilities.

V.P. Shukla also works out the optimum crop combination for a few rainfed farms in Jabalpur district (Madhya Pradesh) under the traditional and advanced technology. Ram Murti and V. Prasad find that under dry farming conditions in Banda district (U.P.) Bajra, Arhar + Urd and Jwar + arhar + urd could increase per hectare net income by 74.07 percent and 55 percent respectively. S.S. Kahlon and H.S. Sandhu identify dry farming zones in Punjab and make an interesting study of the zonal characteristics, moisture conservation methods and pattern input use and net profits from crops grown in these zones. Mercier J.R. and Riviere G. try to discuss "The economics of dry farming in Andhra Pradesh through rainfall stimulation."

On the basis of the papers a new package of dry farming technology was offered. The country's fourth plan envisages inter alia, soil and water management, water harvest, involving dry resistant practices. In this regard can be raised and discussed :

A) What has been the progress in the soil management water harvest, involving, drought resistant high yielding, short duration and photo intensive crop varieties for the dry farming areas ?

B) What are the factors responsible for the slow progress in developing the new package of dry farming technology ?

C) What are the financial requirements and what institution and administrative measures are necessary for the effective implementation of the new package of dry land technology ?

Some papers suggest that provision of irrigation facilities in the dry farming areas is likely to increase farm incomes and farm labour employment through increased cropping intensity. If this is true, one may expect an

increase in the wage rates of farm labourers at least in the peak season and also a reduction in the income disparities between dry and irrigated areas. The economic aspects of converting dry areas into irrigated areas need to be concerned only with "productive" irrigation projects such as Nagarjuna Sagar project of Andhra Pradesh, Hirakund Project of Orissa, Cauvery Mettur irrigation system of Tamil Nadu, Tungbhadra project of Mysore state.

This requires a study of the Agro Economic factors responsible for the poor performance of agriculture in such rainfed areas for corrective government measures to ameliorate the farming conditions and to sustain the agricultural growth. This study is an attempt in this direction with special objectives which are :

1) To study cropping pattern in the region.

2) To estimate the input relationship and the resource productivity and to examine the resource use efficiency in the area. The present study is purposely being followed to the cause and effect as by land farming appears to be the natural and normal feature in the district.

v) Conceptional Framework :

The various technical terms and the concepts used in the study are being stated below :

a) Operational Holdings :

The area of land actually cultivated during the agricultural year under study, which is the unit of decision making and farm management, irrespective of the legal title (i.e. the nature of right in land) or location. The terms 'farm' or 'holding' used in the discussion refer to operational holding.

b) Size of Holdings :

The term 'size of holding' is taken in the sense of the net cultivated area.

c) Cultivated area :

It means the net sown area plus the area left fallow for a season or more, during the agricultural year.

d) Cropped area :

It is area actually sown or put under cropping programme, which is commonly termed as the net cropped area.

There are two other related terms :

i) area sown more than once or put under multiple or successive cropping and

ii) total cropped area, which is equal to the net cropped area plus the area sown more than once.

e) Cropping Intensity :

The concept to cropping intensity is taken in the sense of the degree of cropping. It is an expression of the ratio of the total cropped area to the net area sown or net cultivated area during an agricultural year.

$$C.I. = \frac{\text{Total cropped area}}{\text{Net cropped area}}$$

(If it is expressed in terms of indices, it is to be multiplied by 100)

f) Farm family :

It is composed of all the members of farm household inclusive of males, females and children. Those below 14 years were taken as children.

i) Farm Family Workers :

All adult male, female and children who work on the farm were treated as farm were treated as farm family workers.

ii) Farm Workers :

Include farm family workers and permanent farm servants.

g) Man Days :

The unit of work equivalent to 8 hours of work of

a male adult worker is treated as man day.

h) Animal Labour pair day :

Units of work equivalent to 8 hours work by a pair of drought animals it is synonymous to bullock on animal labour day or pair day.

i) Farm Assets (investment) :

These include owned land, farm buildings (nonresidential) wells, live stock, implements and machinery.

j) Working capital :

It includes the value of seeds, manures and fertilizers, insecticides and pesticides.

k) Inputs :

These include :

i) Wages of hired labour (cash and kind).

ii) Imput value of the family labour,

iii)Value of hired and owned animal labour,

iv) Value of seeds, manures and fertilizers, (farm produce and purchased).

v) Depreciations of farm buildings, machinery and implements.

vi) Rent paid for leased land.

vii) Rental value of owned land,

viii) Interest on owned fixed capital,

ix) Irrigation charges, land revenue, water rates, cess etc.

x) Interest on working capital

l) Output of gross income :

The value of total produce including main and by-product at harvest, prices for different products. Output refers to the physical (quantitative) aspect and gross income to its monetary value).

m) Cost concepts :

A number of cost concepts such as cost A1 cost A2,

cost B and cost c have been used in the analysis. The input items included under each category of cost are indicated below :

a) Cost A1- it includes :

i) Value of hired human labour,

ii) Value of hired and owned bullock labour,

iii) Hired machinery charges,

iv) Value of owned machine labour,

v) Value of seeds (both farm produced and purchased)

vi) Value of manure (owned purchased) and fertilizers,

vii) Value of insecticides and pesticides,

viii) Depreciation on implements and farm buildings,

ix) Irrigation charges,

x) Land revenue, cesses and other taxes,

xi) Interest on working capital including crop loans.

b) Cost A2 = Cost A1 + Rent paid for leased land.

c) Cost B = Cost A2 + Imputed rental value of owned land (less land revenue paid there on) + Imputed interest on owned fixed capital (excluding land)

d) Cost C = cost B + Imputed value of family labour.

The individual cost items included in total cost, i.e. cost c, can also be grouped into operational and fixed cost as under :

operational cost = family labour

\+ Value of hired human labour

\+ Value of hired and owned bullock labour

\+ Value of hired and owned machine labour,

\+ Value of seeds

\+ Value of manures and fertilizers

\+ Water expenses

\+ Interest on working capital

Fixed cost = cost C - operational cost

CHAPTER- II

Methodological Procedure

i) Identification of the Problems

ii) Objective of the study

iii) Scope of the study

  a) Coverage

  b) Aspects

  c) Reference period

iv) Assumptions/Hypothesis

v) Method of Study

  a) Design of the Study

  b) Methods of Data Collection

  c) Methods of Calculation and Analysis

vi) Methods of Measurements

CHAPTER - II

Methodological Procedure

i) Identification of the problems

Banda district (U.P.) presents a peculiar picture of agriculture which is highly diversified. The agrarian situation in this district is very much different from that in the surrounding districts. Though, the district bears the hospitality of Yamuna and its helping rivers, still the most of the land, specially during Rabi season, is being practised as dry land farming. The soils, despite being productive give poor results. The man power despite being healthy is bound to live hand to mouth. The outcome presents different system's conditions and situations of farm economy which are very much different from those of common pattern of Indian agriculture and the typical agrarian economy of U.P. It is highly interesting and should be of great significance to inquire into and to know as to how it has persisted for the last 4 decades, what new situation is has presented, what new problems it has posed and how have the farmers adjusted their life and farm activity. Therefore the present study is intended to be,

part from academically interesting, worth while in terms f the situations it is likely to reveal and the clues t may provide for transforming traditional into commercial nd specialized agriculture elsewhere.

In the context of growth the importance of dry land arming, being normal feature where the agriculture is ainfed is widely realized. This experience should, therefore, e worthy of note because by and large, farms in India re small and with growth in population and in furtherance f democratic socialism (allotment of very small pieces of and to the landless) are further breaking up into still naller sizes. Our state government too seems to be earnest n this matter. The trend in U.P., therefore, seems to e for the general pattern of small farming units. In such, setup, the study of "Dry Land farming An Economic Analysis with special reference to Banda district, U.P.)" which leads o intensification, modernisation and commercialization of arms assumes special significance.

Uttar Pradesh is a thickly populated state of India onsisting of twelve divisions. Jhansi is one of them. It omprises of five districts viz, Jhansi, Lalitpur Jalaun, amirpur and Banda. The channel development i.e. state, ivision and district is of backward nature sloping downward.

In the year 1991 out of the whole population of the istrict the percentage of the urban population was found o be 12.8% i.e. about 87% reside in villages.

The main occupation of the inhabitants of this district s agriculture. In this district 59.94% of the people are griculturists 25.8% labourers and 14.22% belong to other ccupations. This indicates the source of livelihood, i.e. ain stay is agriculture. In 1991, the daily income of abourers was Rs. 25/-. The agriculture labourer gets mployment only for 189 days in a year and the rest of

the days he remains unemployed. The agricultural labourer suffers from disguised unemployment and seasonal unemployment. Only a few small and cottage industries are seen. The standard of living of rural folk is very poor obviously. The rural economy is unsettled and suffers many odds.

Social inequality, blind faith, superstitious beliefs, untouchability, illiteracy etc. are prevailing in their climax in comparison to other districts. The unequal distribution of land, use of traditional means of agriculture, lack of means of irrigation etc. are such situations which put agriculture on margin leaving behind no surplus.

At present the district Banda covers the largest area of Vindhya Plateau covering Mau and Karwi sub-divisions of the district. It is rocky and covered with forests, bushes, grasses and is drought prone. The agriculture in this part is mainly of pastoral type. In U.P. the district occupies top rank in child labour and second in women labour.

The major part of the district comes under the drought ridden area. The dry land farming is practised for quite a long time. The agriculture is rainfed.

The area of this district is 7624 square kilometre. Only 25.50 percent of this area is fit for cultivation. Out of which only 2.67 percent of area is net sown and 18.67 percent of it, is sown more than once. The whole area sown is 18.93 percent. Net irrigation area is 5.07 percent which is much less in comparison to other area, i.e. the degree and extent of irrigation is very poor.

Under these circumstances the proposed study "Dry Land farming An Economic Analysis (with special reference to Banda district U.P.)" assumes special significance so as to see how the farmers have adjusted their life with their farming activities ? The outcome may draw a unique illustration of learning from this kind of work.

ii) Objective of study :

The aim of present study is to see how the dry land farming that is being practised in some regions leading to unevenness in agricultural growth specially since the green revolution came into existence. How and why these disparities have emerged ? What factors are responsible ? Were the policies and programmes not similar? Were the resources different, etc.... are the questions to be answered. In brief the objective flourishes to overcome hazards, to accelerate economic growth to feed millions and thus, to sustain democratic values. The challenge to meet the problem is how to promote inter-regional co-ordination in order to bridge the gap between poverty and unemployment among the rural people, i.e. to search out ways and means to accelerate the pace of development in different sectors in comparatively less developed areas in the district.

The main objectives of the proposed study are as follows:

1) The present geographical configuration and socioeconomic structure of the district and its people.
2) To find out the influx of the nature of farm resource endowment.
3) To analyse the degree and extent of irrigation and adoption of Highly yielding varieties programme.
4) To find out the cost, income and profit of the selected crops under dry farming.
5) To compare the returns of selected crops.
6) To determine the role of dry land farming in rural economy of the district.
7) To look at the various problems and to suggest remedial measures. Briefly speaking, the objective of study is the critical evaluation and assessment of cost and income incurred on dry land farming and to judge the feasibility of farmers efforts which

they adopt as agricultural activity.

iii) Scope of the study :

In Banda district an observation of investigation, will include the study of the area of dry land (main blocks of karwi and Mau subdivision) farming, and of farmers and the crops.

a) Coverage :

The study is envisaged particularly to the Banda district, U.P. The enquiry relates to 13 blocks of Banda district. For some micro level tests, the Mahua and Barokhar Khurd block are chosen taking into consideration four villages which are by the illustration of respective farming units of farmers. In view of the extent of dynamics in agricultural production and yield, the principal crops viz, wheat, rice, jwar, Maize, Barley, Gram, Pea, Arhar, Linseed, lentil, Bajra, Sarson (Mustard), sugar cane and potato were analysed. To trace agricultural returns, the popular crops wheat, gram lentil and linseed were considered.

b) Aspects :

The research study includes subject matter pertaining to different aspects, like-social, Economic, political, historical, cultural and demographical micro study of district Banda (Dry land farming-An Economic Analysis) specially as a subject pertaining to different aspects in reference to Mahua and Barokhar blocks. More importance will be given directly to social and economic aspects. The research study will mainly be connected with economic side.

The economic activities i.e. settlements between the farm income and their family liabilities, how and in which manners occur, is main criterion or

aspect of the study.

c) Reference period :

For the research study the period between 1992-93 to 1994-95 will be taken and during the period in between these years light is thrown on the benefit analysis.

iv) Assumptions :

An hypothesis or assumption is the basic and primary step towards the work or procedure we want to start. The research requires to know the main constraints and variables, certainly responsible or known phenomenon or hidden facts behind the problem. One can not go ahead without formulating some ideas. In past or today, the theories and laws, all have been detected on the basis of hypothesis or assumptions. The method or the data collection or the presentation of the nature of variables is not possible without postulates. It is rather a dream which gets realized only after net practice in field or laboratory. The dream is reality, the assumptions are correct, otherwise it is illusion or factless.

The foregoing study too involves certain assumptions according to the practices and traditions which are generally prevalent in the defined area. These are noted as follows:

i) The farming community on the farm side finds no surplus i.e. the return is almost nil.

ii) Still the old traditional methods of farming are being practised here for a quite long time. The methodology towards development seems to be overlooked, generally static or a passive one.

iii) The big segment of population bears no economic activity rather they lead hand to mouth settlements.

v) Method of study :

A) Design of the Study :

The design of the study is stratified three stage random sampling with blocks as the primary sampling unit, a cluster of villages as the secondary unit and the farmers will be the third and ultimate stage sampling unit. However, the selection of crops will be made as to the probability proportion of the area.

B) Method of Data Collection :

Both the documentary and interviews methods have been used in this study. Primary data have been collected by direct personal interviews while secondary data have been taken from published and non-published resources and partly from the official records of the Bulletins of agricultural statistics of U.P., published in the year 1990-91 to 1995-96 and the basic statistics published by government of U.P., Land records department and other informations from revenue department, District census report 1991, District Gazetteer, assessment and settlement reports will be the main source of consultation. The researcher also discussed with some officers of the different offices regarding difficulties posed by them.

For the purpose of personal investigation, a field survey of farmers a three stage stratified random sampling technique has been adopted for selecting the block, villages and farmers. The criterion for selection of blocks and villages is followed according to probability proportion to the area of selected crops.

a) Selection of Blocks :

Out of 13 blocks of the district Banda, two blocks Barokhar Khurd and Mahua have been selected on purpose on the basis of maximum crop production and probability proportion of the area. These blocks

Cropped Area Figures Under Selected Crops - 1994-95

Sl.No.	Blocks	Wheat		Gram		Lentil		Linseed	
		Area in Hec.	%age	Area in Hec.	%age	Area in Hec.	%age	Area in Hec.	%age
1.	Jaspura	06605	3.55%	12388	8.43%	0582	1.58%	0300	4.31%
2.	Tindwari	14254	7.67%	16495	11.23%	5178	14.02%	0838	12.04%
3.	Badokhar Khurd	17134	9.22%	17845	12.15%	8043	21.77%	1721	24.72%
4.	Baberu	16162	8.69%	13550	9.23%	5579	15.10%	0723	10.39%
5.	Kamasin	10674	5.74%	14920	10.16%	4193	11.35%	0357	5.13%
6.	Bisanda	23870	12.84%	05582	3.80%	4617	12.50%	0309	4.44%
7.	Mahua	25968	13.97%	04227	2.88%	5491	14.86%	0271	3.89%
8.	Naraini	25498	13.71%	14314	9.74%	1504	4.07%	0401	5.76%
9.	Pahari	13321	7.16%	15495	10.55%	0603	1.63%	0484	6.95%
10.	Karwi	12807	6.89%	08268	5.63%	0910	2.46%	0256	3.68%
11.	Manikpur	09373	5.04%	08180	5.57%	0129	0.35%	0397	5.70%
12.	Ramnagar	05155	2.77%	08330	5.67%	0052	0.14%	0398	5.72%
13.	Mau	04970	2.67%	07137	4.86%	0060	0.16%	0503	7.23%
Total of Rural		185791	99.92%	146731	99.90%	36941	99.99%	6985	99.96%
Total of Urban		000145	0.08%	000150	0.10%	0004	0.01%	0003	0.04%
Total of District		185936	100.00	146881	100.00	36945	100.00	6961	100.00

also represent the high agro economic conditions of the district. It is the first stage sampling unit.

The selected crops viz, wheat show concentration in Mahua block while lentil, gram and linseed are saturated in Barokhar block. This can be looked for in the table- 2.1.

b) Selection of villages :

The selection of villages has been done on the basis of maximum crop production and probability proportion to the area. Out of 90 villages of Mahua block Girwan for wheat, out of 83 villages of Barokhar Block Mataundha for gram and Luktara a for lentil and Pachnehi village for linseed have been selected having the high degree of localization of these crops. The visual picture clearly emerges in the table No. 2.2 A,B.

c) Selection of Farmers :

A list of all the farmers of selected villages has been prepared alongwith their cultivated area farmers have been selected randomly following sequence sampling. The selective procedure also envisages the classification of farmers only because of their representation from all kinds. Since it is the basic unit of inquiry more considerate attempts have been made to avoid the slops and errors.

Methods of Calculation and Analysis :

The evaluation sequence is as follows :

i) The cost benefits analysis is followed in calculating the income and return.

ii) An average has been calculated by the formula, viz :

$$\bar{X} = a + \frac{\Sigma dx}{n} \quad \text{or} \quad \bar{Y} = b + \frac{\Sigma dy}{n}$$

Table No. 2.2(A)
Selection of villages (wheat crop)

Sl.No.	Name of villages	Wheat (Non-Irrigated)	(Irrigated)
1.	Akbarpur Girwan	74	77
2.	Ajitpur	-	120
3.	Amritpur Khekha	-	88
4.	Arjunaha	-	437
5.	Rela	3	187
6.	Kawauli	-	307
7.	Kalhara	-	201
8.	Kajipur (Girwan)	-	-
9.	Kiratpur	31	48
10.	Kisurba	-	149
11.	Kolawal Raipur	-	24
12.	Khandih	-	47
13.	Kharaunch	11	154
14.	Khanpur	4	177
15.	Kherwa	-	131
16.	Khohi	-	70
17.	Garhai Chandpur	131	20
18.	Girwan	62	756
19.	Gaindi Mafi	5	82
20.	Gokhiya	-	626
21.	Gopal Khera	-	90
22.	Gore Shivpur	-	17
23.	Gore shivpur	-	17
24.	Chak Mafi	-	3
25.	Chak Kiratpur	-	5
26.	Chak Girwan	-	-
27.	Chak Bandey	-	7
28.	Chak Hadaha	-	5

Table 2.2(A) Continued..........

30.	Famapur	-	42
31.	Jarer	42	79
32.	Gahangirabad	-	76
33.	Jakhari	-	183
34.	Jera Girwan	14	100
35.	Durgapur	7	109
36.	Devrar	272	-
37.	Dubari	73	-
38.	Nandwara	-	221
39.	Naraini Kharks	-	206
40.	Bahadur Mafi	2	-
41.	Chaharpur	-	62
42.	Niboura	-	102
43.	Nihalpur	-	337
44.	Nauhai	-	610
45.	Pachokhar	6	95
46.	Pataura	-	72
47.	Patraha	-	7
48.	Pangara	703	-
49.	Jarphari	-	-
50.	Paharpur	-	281
51.	Pichourabad	-	4
52.	Prempur	7	217
53.	Paigambarpur	-	190
54.	Paundara	78	190
55.	Bandhoi	6	27
56.	Bandey	268	7
57.	Badeha Syonda	284	150
58.	Barokhar Khurd	-	2
59.	Bansarwa	79	-
60.	Bariueri	260	7
61.	Barokhar Buzurg	-	693
62.	Barsanda Khurd	14	72

Table 2.2(A) Continued..........

63.	Balkhora	-	-
64.	Bahadupur Syonde	-	617
65.	Baheri	-	38
66.	Bausi	323	520
67.	Mawai	-	30
68.	Bhasrour	-	199
69.	Mau Girwan	2	-
70.	Majhgawan Syords	159	-
71.	Manipur	-	285
72.	Malehara Niwada	153	-
73.	Madhopur	17	13
74.	Manpur khurd	-	-
75.	Manpur	-	-
76.	Mirjapur	79	162
77.	Mungoura	-	-
78.	Muradpur	-	96
79.	Mungus	-	475
80.	Motiyary	12	251
81.	Morwou	-	-
82.	Rajapur	-	51
83.	Rampur Gurdi	-	271
84.	Risaura	355	120
85.	Reega	-	61
86.	Santpur	-	20
87.	Samastipur	15	70
88.	Sarani Salimpur	-	-
89.	Sarhi Jadid	7	192
90.	Saraswah	-	33

Table 2.2 (B)
Selection of Villages (Gram, Lentil and Linseed Crop)

Sl. No.	Name of Village	Gram Irrigated	Gram Non-Irrigated	Lentil Irrigated	Lentil Non-Irrigated	Linseed Irrigated	Linseed Non-Irrigated
1.	Arbia	-	20	-	142	-	6
2.	Acharoure	-	205	-	167	-	7
3.	Eteua	-	86	4	89	-	4
4.	Ujrchata	-	131	-	-	-	-
5.	Kanvara Bangar	-	89	-	-	-	-
6.	Karbai	-	562	-	27	-	-
7.	Karcha	-	25	-	34	-	1
8.	Katrawal	-	214	-	50	-	6
9.	Kamnauri	-	3	-	12	-	9
10.	Karahiya	-	71	-	83	-	28
11.	Kuwanrpur	1	12	-	238	-	1
12.	Kul Kumhari	-	-	-	4	-	6
13.	Kkurouli	-	35	-	56	-	22
14.	Khairakr	-	60	-	41	-	77
15.	Gancha	-	153	-	17	-	-
16.	Gancha	-	210	-	9	-	-
17.	Kanwara Khadar	5	319	-	288	-	56
18.	Goira Mugali	-	65	-	3	-	-
19.	Chahitara	-	259	-	25	-	203

20.	Chak Chatgan	-	249	-	270	-	5
21.	Chatgan Khar	-	65	-	23	-	-
22.	Chak Bharkhari	-	60	-	2	-	-
23.	Chamraha	-	3	-	13	-	-
24.	Chandera	-	156	-	36	-	32
25.	Chilli	1	53	-	7	-	-
26.	Chandera Lalpur	-	11	-	64	-	-
27.	Cheharaw	27	54	-	58	-	3
28.	Jakhoura	-	210	-	36	-	-
29.	Jamalpur	-	216	-	63	-	4
30.	Jamnipur	3	244	-	184	-	4
31.	Jari	-	40	-	34	-	1
32.	Jaurahi	1	447	-	361	-	1
33.	Dingwahi	-	18	-	23	-	57
34.	Jirveni	-	198	-	33	-	2
35.	Jilehata	-	71	-	12	-	-
36.	Jindwara	-	121	-	244	-	8
37.	Dadariya	-	54	-	71	-	4
38.	Durendi	-	742	-	81	-	11
39.	Doha	-	52	-	54	-	50
40.	Nimnipar	-	13	-	2	-	1
41.	Pathari Bangar	-	109	-	27	-	-
42.	Pathari Khadar	-	7	-	2	-	6

Table 2.2(B) Contd....

43.	Pachulla	-	119	-	32	-	-
44.	Pakui	-	12	-	76	-	1
45.	Palhari	-	20	-	49	-	1
46.	Pachanehi	7	165	-	530	-	205
47.	Pipari	-	97	-	4	-	6
48.	Fatpurwa	12	120	-	153	-	-
49.	Basahari	-	289	-	114	-	74
50.	Barokhar Khurd	-	44	-	69	-	2
51.	Barhi	1	5	-	50	-	2
52.	Barcha	-	42	-	83	-	-
53.	Bargahani	-	107	-	85	-	-
54.	Dudha Purwa	-	1	-	48	-	-
55.	Bisanda Khurd	-	18	-	55		2
56.	Bilwai	-	130	-	121	-	1
57.	Bhawani Purwa Z.A.	-	43	-	31	-	7
58.	Bharkhari	-	54	-	81	-	9
59.	Bhuredi	2	164	-	2	-	8
60.	Mataundh Z.A.	5	1015	-	390	-	8
61.	Mawai Buzury	-	264	-	353	-	100
62.	Marauli Bargar	-	303	-	29	-	74
63.	Marauli Khadar-	59	-	2	-	-	28
64.	Mahai	-	30	-	23	-	7
65.	Mahokhar	8	445	-	197	-	5

66.	Mohan Purwa	-	149	-	465	-	95
67.	Audaha	2	50	-	91	-	5
68.	Rehuda	-	26	-	24	-	4
69.	Rainua	-	7	-	30	-	5
70.	Laraka Purwa	-	392	-	35	-	6
71.	Lama	-	133	-	365	-	22
72.	Luktara	-	280	-	532	-	8
73.	Lohara	-	116	-	25	-	7
74.	Silehata	-	112	-	26	-	-
75.	Surouli	-	81	-	314	-	58
76.	Saimara	8	78	-	90	-	-
77.	Sohana	2	93	-	-	-	-
78.	Hardauli Z.A.	-	155	-	5	-	1
79.	Hateti purwa	-	600	-	21	-	-
80.	Hathaura	-	48	-	24	-	5
81.	Bhawani purwa N.Z.A	-	-	-	-	-	2
82.	Laraka purwa N.Z.A	-	2	-	3	-	2
83.	Hardauli N.Z.A	-	5	-	2	-	-

where a and b are assumed mean of x and y series and x and y are the summations of deviation of x and y series and n the number of items.

iii) The standard deviations of x and y series have been enumerated as follows :

$$\sigma x = \sqrt{\frac{\Sigma d^2x}{n} - \left(\frac{\Sigma dx}{n}\right)^2} \text{ and } \sigma y = \sqrt{\frac{\Sigma d^2y}{n} - \left(\frac{\Sigma dy}{n}\right)^2}$$

Where Σd^2x and Σd^2y are the summations of squared deviations of x and y series.

iv) To find the coefficient of correlation, we have used the following Karl-Pearsons formula :

$$r = \frac{\Sigma dxdy \cdot n - \Sigma dx \cdot \Sigma dy}{\sqrt{\Sigma d^2x \cdot n - (\Sigma dx)^2}\ \sqrt{\Sigma d^2y \cdot n - (\Sigma dy)^2}}$$

Where $\Sigma dxdy$ is the product of summation of x and y series.

v) The two regression equations or regression equation of x/y is;

$$x - \bar{x} = r \cdot \frac{\sigma x}{\sigma y} (y - \bar{y}) \text{ and}$$

the regression equation of y/x is;

$$y - \bar{y} = r \cdot \frac{\sigma y}{\sigma x} \cdot (x - \bar{x})$$

where : $\bar{x}$, $\bar{y}$, σx and σy have their usual meanings and $r \cdot \frac{\sigma x}{\sigma y}$ and $r \cdot \frac{\sigma y}{\sigma x}$ are two regression coefficients of x/y and y/x respectively.

vi) The probable error is : $P.E. = \cdot 6745 \frac{1 - r^2}{\sqrt{n}}$

Where $1 - r^2$ represents the degree of non-determination and r^2 the degree of determination.

vii) To test the relationship, we have followed the simple technique,

r > 6P.E., the relationship is significant and if

r < 6P.E., the relationship is nonsignificant.

viii) The percentage and their changes have been estimated by the traditional method.

ix) For a common mind, to understand the changes, we have taken the help of graphical representation, in various agricultural variables.

However, we have intentionally avoided further sophisticated statistical analysis. This is done because of small sample size, which is proportional one and where as the number of cases (cultivators) in different size groups is not similar. The purpose of selecting the farmers from the different size-groups on the basis of percentage distribution relate mainly for the purpose of diagnosis of the problems of farmers (specially of small scale farming) under a situation when the traditional agriculture transforms or changes to modernised agriculture.

Further to judge the role of inputs and output, the various returns and ratios have been worked out viz, input-output ratio, return on capital (investment-profit ratio), return on labour (family as well as total) and return on land, etc. as for the methods mentioned above.

vi) Methods of Measurement

i) Cost Items :

A) Evaluation of farm Inputs :

1) Human Labour :

a) **Casual-** It is evaluated at the general wage rate prevailing in the localities. Kind payments are evaluated at harvest prices.

b) **Permanent Hired Labour :** Wages of permanent hired labour include payment made in cash and/or kind/ or other perquisites. The value of kind payments is evaluated at harvest prices.

c) **Family Labour :** It has been charged at the same rate as in the case of permanent hired labour in the locality. Family farm

workers were evaluated as follows :

Man : A worker above 16 years of age was treated as an adult worker.

Woman and children : The woman and child workers were concerted into male adult units on the basis of wages paid to them. The 3 women were treated as two adult male units and in the case of children, two children were treated as one male adult unit.

2) **Bullock Labour** : The actual method of evaluating the bullock labour cost is to divide the total cost of maintenance of the bullock used in farm operations by the number of working days on the farm. But due to the non-availability of the data, the bullock labour was evaluated at the prevailing hired rate in the locality.

3) **Manures and Fertilizers** : Manure and fertilizers have been valued at the actual cost price plus transport charges. The value of the home produced farm yard manure has been calculated at the rates prevailing in the villages. No allowance has been made for the residual value of the manure.

4) **Seed** : farm produced seeds were evaluated at the prevailing price at the sowing season, where as actual costs were charged for the seed purchased from out side.

5) **Interest on working capital** : Interest on cash or kind expenses during the period of cultivation was charged at 13% per annum for the duration for which the crop stands in

the field.

6) **Irrigation charges :** The cost of irrigation was also taken at the prevailing rates in the locality for hired tubewells and for canal water, charges on area basis. This includes the actual charges levied by the Govt.. at scheduled rates for different crops for the use of canal water. However, in the case of owned tubewells, the actual irrigation cost was charged.

7) **Farm Buildings and Implements :**

   a) **Depreciation :** It has been charged at 10% rate.

   b) **Interest on Fixed Capital :** On owned fixed capital at the rate of 10% while on borrowed capital at the actual rate which was 13%.

   c) **Repairs :** The actual repairing cost was taken for the purpose.

8) **Land Revenue, Taxes, cesses etc. :** The actual amount paid to the Govt. was taken.

9) **Rent :** The rent on owned land (by cultivator) was estimated on the basis of prevalent rates in the villages for identical type of land.

B) **Evaluation of Main and By product :**

The main product value was imputed on the basis of actual sale price while the by product at the post harvest prices prevailing in the locality. The main product consumed by the family was evaluated at harvest prices.

c) **Evaluation of farm Assets :**

The following procedure was adopted :

i) Owned and self cultivated land was evaluated

at the rates prevalent in the villages taking into account the differences in types of soil, distance from the village and source of irrigation etc.

ii) farm buildings (cattle sheds, storage sheds etc.) were evaluated at prices prevailing in the villages.

iii) Implements and other farm machinery were evaluated at prevailing market prices.

d) Allocation of Joint Costs :

i) Land Revenue and Taxes :

It is allocated on the basis of duration of crop stands in the field.

ii) Depreciation and Repairs :

a) Farm Buildings :

Depreciation and repairs on farm buildings were charged in proportion to the average area under the crop to the total cropped area. In case, the buildings are used only for a particular crop, the whole amount has been charged to that crop.

b) Implements :

The allocation has been made in proportion to the area under the crop.

c) Apportion of cost :

It means the distribution of cost between main product and by product. It is divided in proportion to their values (main & by product).

iii) Returns :

a) Gross Income :

It is calculated by multiplying the total farm production by the prices of various

farm goods.

b) **Net Income :**

i) **Net Income Over Cost C :** It is calculated by substracting all paid and unpaid expenditures from gross income.

Net Income = Gross income - cost C

ii) **Family Labour Income or Net Income Over Cost B :** It includes net farm income plus imputed value of the unpaid family labour and his family during the year.

Family labour Income = Gross Income-Cost b F.L.I. = G.I. Cost B

iii) **Farm Business Income :** It is the measure of earning of the farmers and his family for management risk, their labour and capital invested. It is calculated as follows :

F.B.I. = G.I. - Cost A, (A in the case of tenant farm)

c) **Rate of Return :**

i) **Input output ratio :** It is calculated by dividing the gross income by the cost incurred (total investment) for a particular crop. e.g.

$$\text{I.O. Ratio} = \frac{\text{Gross Income}}{\text{Total cost (investment)}}$$

ii) **Profitability Rate :** It is the return on capital and expressed in terms of Investment- Profit Ratio, e.g.

$$\text{I.P. Ratio} = \frac{\text{Net Income or Profit}}{\text{Total cost or Investment}}$$

iii) **Return on Labour :** It is divided into two parts and was calculated as follows :

a) Return on family labour

$$= \frac{\text{Net Income}}{\text{Family Labour}}$$

b) Return on family labour

$$= \frac{\text{Net Income}}{\text{Total Labour}}$$

iv) **Return on Land :** It is also calculated by dividing the net income by the rental value of land.

CHAPTER- III

Resource Endowment

i) Human Resources :

a) Population

b) Skilled & Non Skilled/literate & illiterate

c) Technical

ii) Natural :

a) Soil

b) Water

c) Minerals/forests

iii) Institutional

CHAPTER- III

Resource Endowment

i) Human Resources :

a) Population :

According to 1991 census, the total population of the district was 1862139 with a heavy concentration in the rural areas estimated at 87.14% rural and urban population was 1622718 and 239421 respectively. Out of the total number of rural population 1622718, males were 880464 and females 742254 respectively. The total number of urban population was 239421 out of which 130760 were males and 108661 were females.

In 1901 the population of Banda district was 619186 and after nine decades in 1991 it marked upto 1862139. During this period, specially in 1921 it declined and in 1961, it increased, however, with faster speed. In 1991 too it indicated increasing trend but not so sharp as it must have been.

Rural and urban population and the rate of increase in population is given in Table No. 3.1, 3.2.

The population density of the district as per 1991 census was 244 persons per sq. km. The sex ratio is 841 female per thousand males. In 1991 out of the total population Hindus were 94.43% and the followers of all the other religions were 5.57%. Thus there was a majority of Hindus.

Table No. 3.1
Population (in lacks)

Year	Total Population	Percent	Decential Percent Increase
1901	619186	6.19	-
1911	645222	6.45	+ 4.00
1921	602828	6.03	- 7.00
1931	640848	6.41	+ 6.00
1941	740219	7.4	+ 16.00
1951	790247	7.9	+ 7.00
1961	953731	9.54	+ 21.00
1971	1182215	11.82	+ 24.00
1981	1533990	15.34	+ 30.00
1991	1862139	18.62	+ 21.00

Source : Census 1991

TABLE NO. 3.1 -> DECADEWISE INCREASE

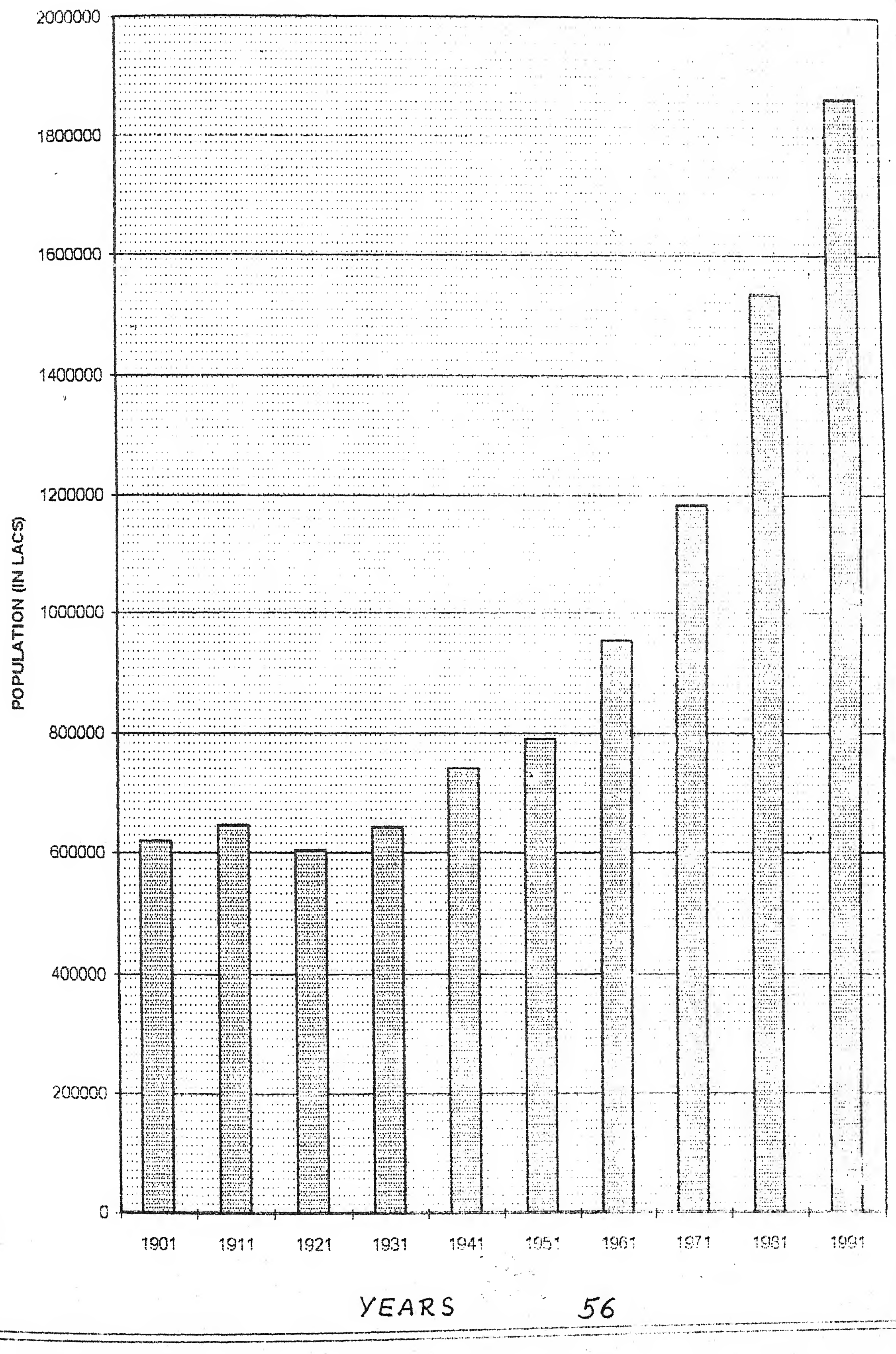


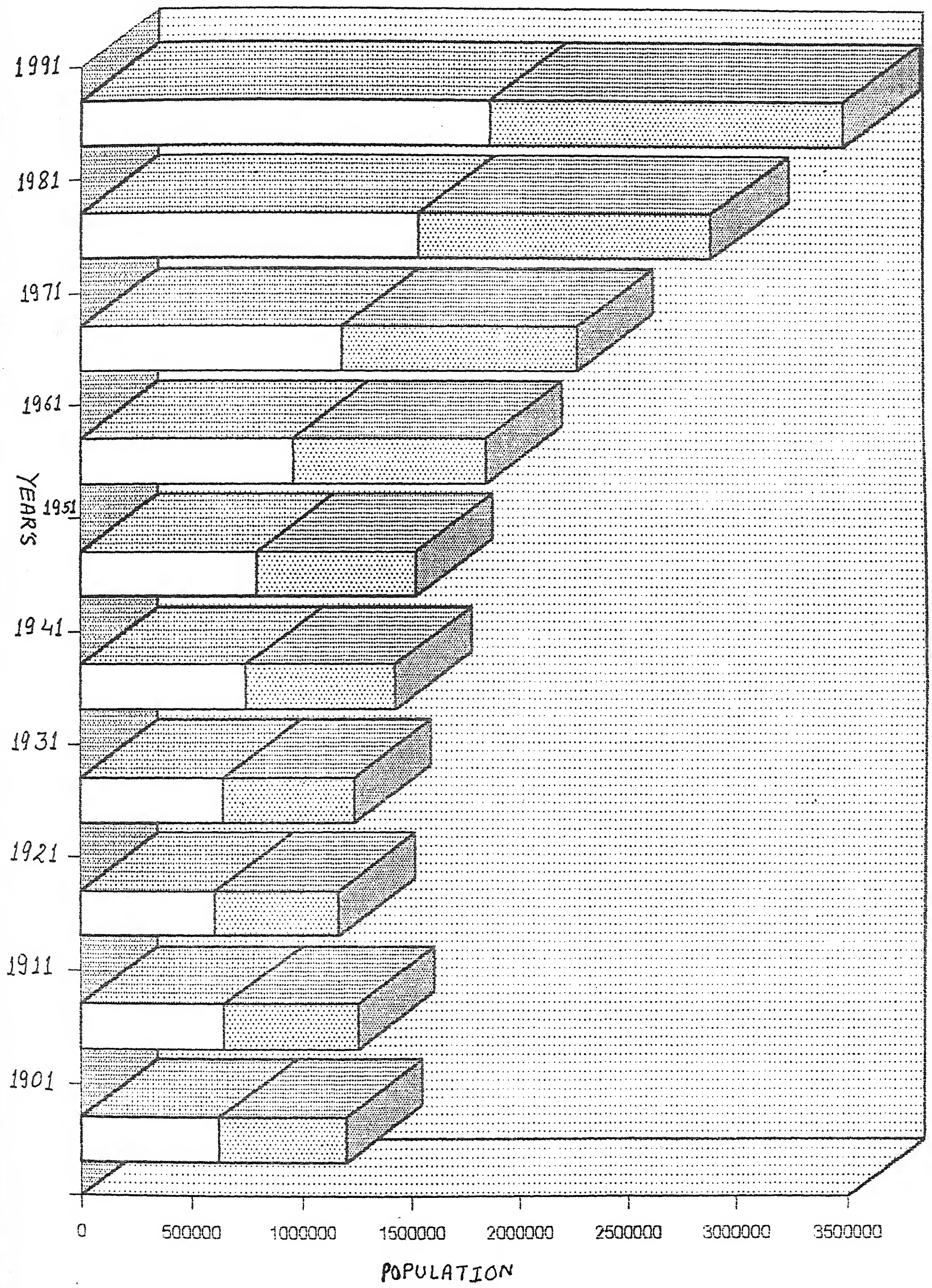
Table No. 3.2

Percentage of Decade Population

S.N.	Year	Population		Decential Percent Increase		
		Total	Rural	Total	Rural	Urban
1.	1901	619186	578528	-	-	-
2.	1911	645222	609199	+4.00	5.00	11.00
3.	1921	602828	562458	+7.00	8.00	12.00
4.	1931	640848	597258	-6.00	6.00	8.00
5.	1941	740219	686931	16.00	15.00	22.00
6.	1951	790247	731445	07.00	07.00	10.00
7.	1961	9537731	890270	21.00	22.00	8.00
8.	1971	1182215	1084259	24.00	22.00	54.00
9.	1981	1533990	1352905	30.00	25.00	84.00
10.	1991	1862139	1622718	21.00	20.00	32.00
11.	1901 to 1991	-	-	200.7	180.5	488.9

Source : Census 1991

TABL NO.->3.2 THE DIFFERENTIAL DECADE POPULATION



The percentage of schedule castes and schedule tribes was 23.2% in Banda. But out of the total population of the state the percentage of schedule caste and schedule tribes was 1.5%

1) Rural Population of the District :

In the year 1971 the total population of the district was 1084259 out of which 578209 were males and 506050 were females and the rate of increase was 21.79 percent.

After 10 years in the year 1981 the total population was 1352905 out of which 723695 were males and 629210 were females. The rate of increase was 24.78 percent.

After 10 year in 1991 the total population was 1622718. Out of which 880464 were males and 742254 were females. The percent decreased this time. It was 19.94 percent. Table No. 3.3 shows block wise sex distribution of population, Table No. 3.4 shows increase of rural population in three decades.

2) Religion Wise Population :

In the year 1981 the total of the Hindu population was 1448485 out of which 1290721 were rural and 157764 were urban. The percentage of the total population was 94.43 percent.

The total of the Muslim population was 84493 out of which 61870 were rural and 22623 were urban. The percentage of total population was 5.51.

The total population of Christians was 523 out of which 264 were rural and 259 were urban. The percentage of total population was 0.03.

The total population of Jains was 416. Out of which 31 were rural and 385 were urban. The percentage of total population was 0.03.

Table No. 3.3
Population Distribution (Sex)

District/Block	Total Population	Male	Female
Banda	18,62,139	10,11,230	8,50,909
	(100.00)	(54.30%)	(45.69.%)
Jaspura	79,515	43,045	36,470
	(100.00)	(54.13%)	(45.87%)
Tindwari	1,24,021	68,135	55,886
	(100.00)	(54.94)	(45.06%)
Barokhar Khurd	134982	74514	60,468
	(100.00)	(55.20%)	(44.80%)
Baberu	1,44,290	78,477	65,813
	(100.00)	(54.39%)	(45.61%)
Kamasin	1,19,671	65,094	54,577
	(100.00)	(54.39%)	(45.61%)
Bisanda	1,32,303	71,801	60,502
	(100.00)	(54.27%)	(45.73%)
Mahua	1,52,411	83,271	69,140
	(100.00)	(54.64%)	(45.36%)
Naraini	1,98,111	1,07,883	90,228
	(100.00)	54.46%)	(45,54%)
Pahari	1,33,516	71,647	61,869
	(100.00)	53.66%)	(46.34%)
Karwi	1,23,697	66,607	57,090
	(100.00)	(53.87%)	(46.15%)
Manikpur	1,15,355	62,111	53,244
	(100.00)	(53.84%)	(46.97%)
Ram Nagar	65,370	35,023	30,347
	(100.00)	(53.58%)	(46.42%)
Mau	98,993	52,582	46,441
	(100.00)	(53.17%)	(46.88%)

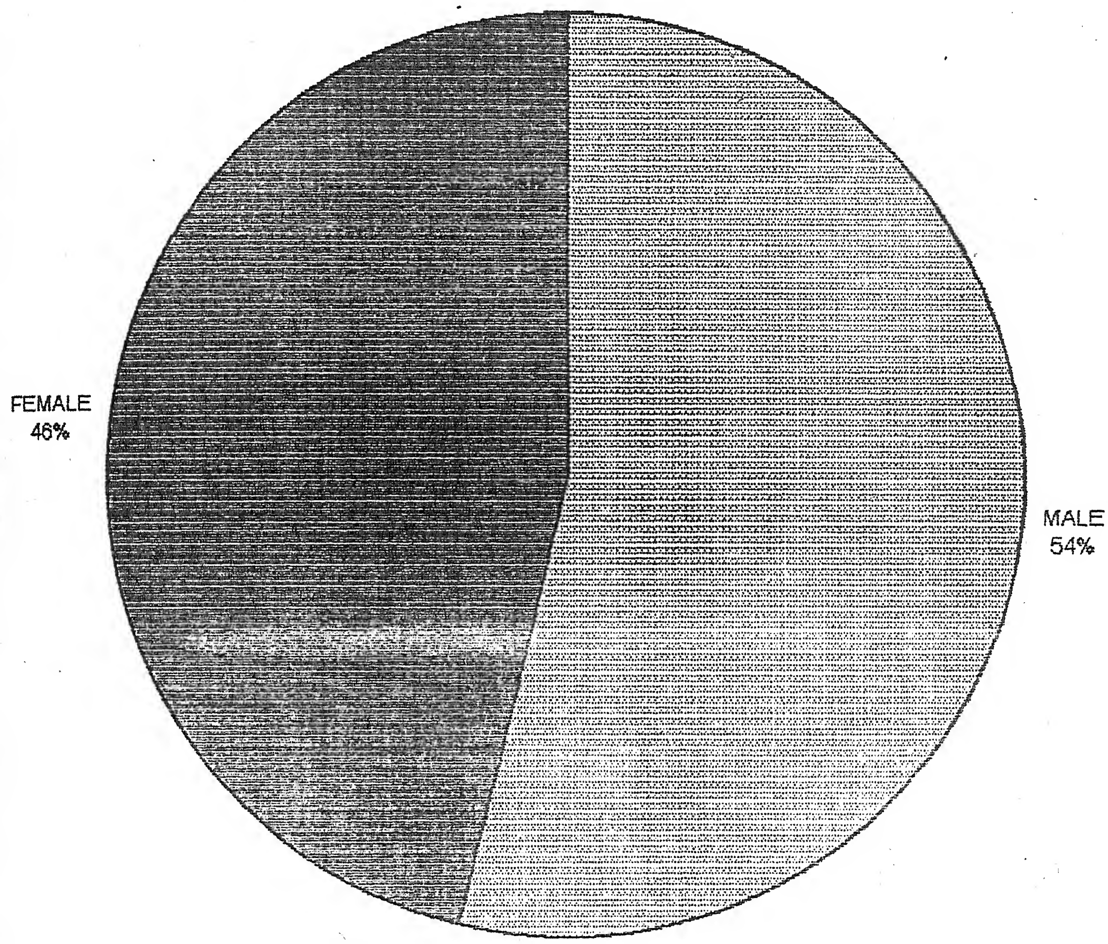
-Source : Census 1991

Table No. 3.4
Rural Population of District

S.N.	Years	Population of Rural Area Total	Male	Female	Increase of percentage in last decades
1.	1971	1084259	578209	506050	21.79
2.	1981	1352905	723695	629210	24.78
3.	1991	1622718	880464	742254	19.94
	Blocks- 1991				
1.	Jaspura	79515	43045	36470	20.89
2.	Tindwari	124021	68135	55886	11.39
3.	Barokhar	134982	74514	60468	20.79
4.	Baberu	144290	78477	65813	18.97
5.	Kamasin	119671	65094	54577	19.51
6.	Bisanda	132303	71801	60502	19.05
7.	Mahua	152411	83271	69140	16.62
8.	Naraini	19811	107883	90228	23.21
9.	Pahari	133516	71647	61869	19.42
10.	Karwi	123697	66607	57090	27.88
11.	Manikpur	115355	62111	53244	21.74
12.	Ram Nagar	65370	35023	30347	20.38
13.	Mau	98993	52582	46411	21.89
	Total of Blocks	1622235	880190	742045	20.02
	Total of forest	483	274	209	60.18
	Total of Rural	1622718	880464	742254	19.94
	Percent		100.00	54.26	45.74

Source : Census 1991

TABLE NO. 3.4-> RURAL POPULATION OF DISTRICT



The total of others was 73, out of which 19 were rural and 54 were urban. Table No. 3.5 shows religion wise population.

3) Caste Wise Population :

In the year 1971 the total population of schedule castes was 273106. Out of which 143475 were males and 129631 females.

After 10 years, in 1981 the total population of schedule castes was 362496 out of which 194792 were males and 167704 females.

After 10 years the total population of schedule castes was 432884. Out of which 234444 were males and 198440 females.

In 1971 the total population of schedule tribes was 223. Out of which 118 were males and 185 females.

After 10 years in 1981 the total population of schedule tribes was 15. Out of which 8 were males and 7 females. Again after 10 years in 1991 the total population of schedule tribes was 43. Out of which males were 29 and females were 14. Table No. 3.6 shows caste wise population.

b) Skilled & Non-Skilled/literate & illiterate

As Banda district is the most backward in whole of the Bundelkhand region, the social evils and economic disparity exist in its climax. Untouchability, blind faith, social injustice etc. are prevalent here. The root cause of all these evils is illiteracy. Due to presence of illiteracy, people are unable to understand things in their right form. They do not know the real meaning of religion, they are ignorant of modern techniques of agriculture so they face economic crisis. Had they been literate their condition would have been much better in every respect.

Table No. 3.7 shows the pitiable condition of literacy- In 1971 total number of literate was 217363 out of which

Table No. 3.5

Religion wise Population

S.N.	Religious Communities	Population Total	Rural	Urban	Percent
1.	Hindu	1448485	1290721	157764	94.43
2.	Muslim	84493	61870	22623	5.51
3.	Christian	523	264	259	0.03
4.	Sikh	54	13	41	-
5.	Baudh	6	6	-	-
6.	Jain	416	31	385	0.03
7.	Others	13	-	13	-
	Total	1533990	1352905	181085	100.00

Table No. 3.6

Population Castewise

S.N.	Years District/ Blocks	Total	Population of SC Male	Population of SC Female	Population of ST Total	Population of ST Male	Population of ST Female
1.	1971	2731106	143475	129631	223	118	185
2.	1981	362464	194792	167704	15	8	7
3.	1991	432884	234444	198440	43	29	14
Block		1991					
1.	Jaspura	9613	5185	4428	-	-	-
2.	Tindwari	24021	13193	10828	-	-	-
3.	Barokhar	30047	16501	13546	-	-	-
4.	Baberu	32033	17391	14642	-	-	-
5.	Kamasin	26549	14540	12009	-	-	-
6.	Bisanda	39379	21232	18056	-	-	-
7.	Mahua	42475	23438	19037	40	28	12
8.	Naraini	42475	23438	19037	40	28	12
9.	Pahari	33569	17912	15657	-	-	-
10.	Karwi	27491	14736	12755	2	-	2
11.	Manikpur	41635	22156	19479	-	-	-
12.	Ram Nagar	16696	8926	7770	-	-	-
13.	Mau	25798	13616	12182	-	-	-
Total of Block		392419	212316	180103	42	28	14
Total of forest area		334	185	149	-	-	-
Total of Rural		392753	212501	180252	42	28	14
Total of Urban		40131	21943	18188	1	1	-
Total of District		432884	234444	198440	43	29	14
Percent		100.00	54.16	45.84	100.00	67.44	32.56

TABLE NO.3.6 POPULATION OF SCHEDULE CASTE

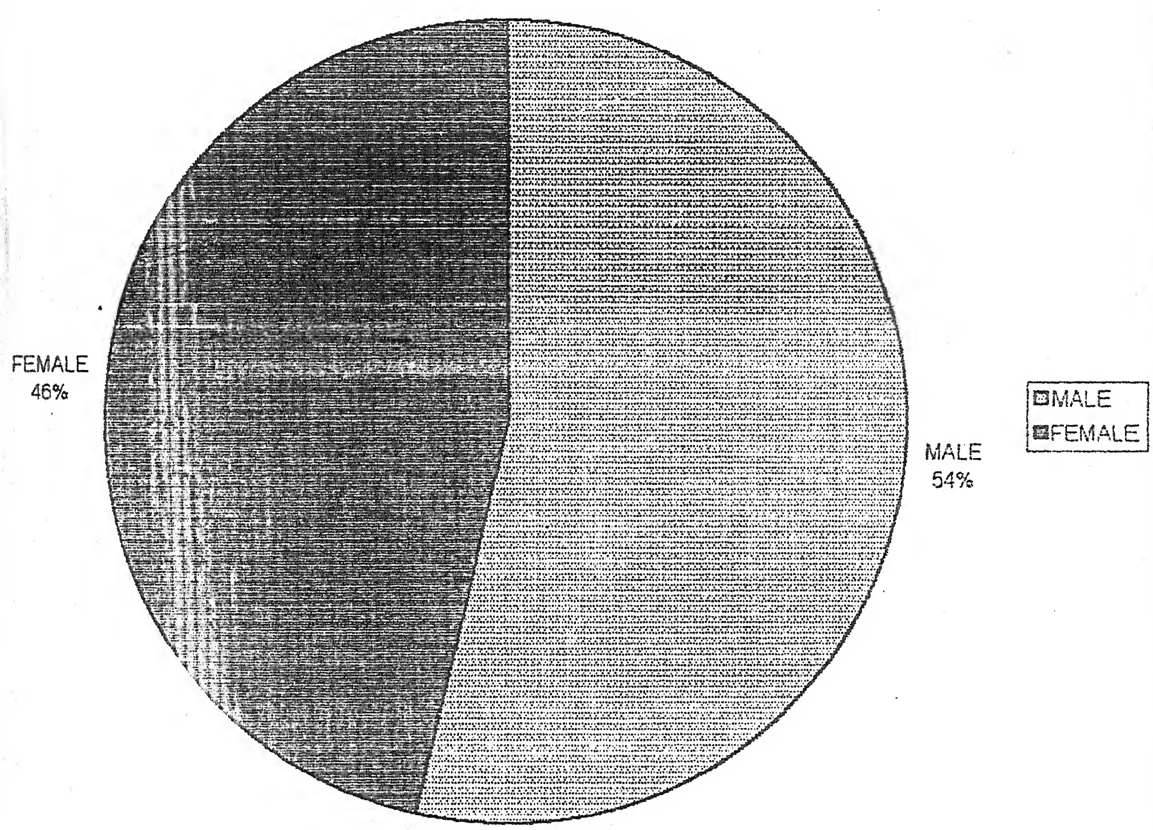
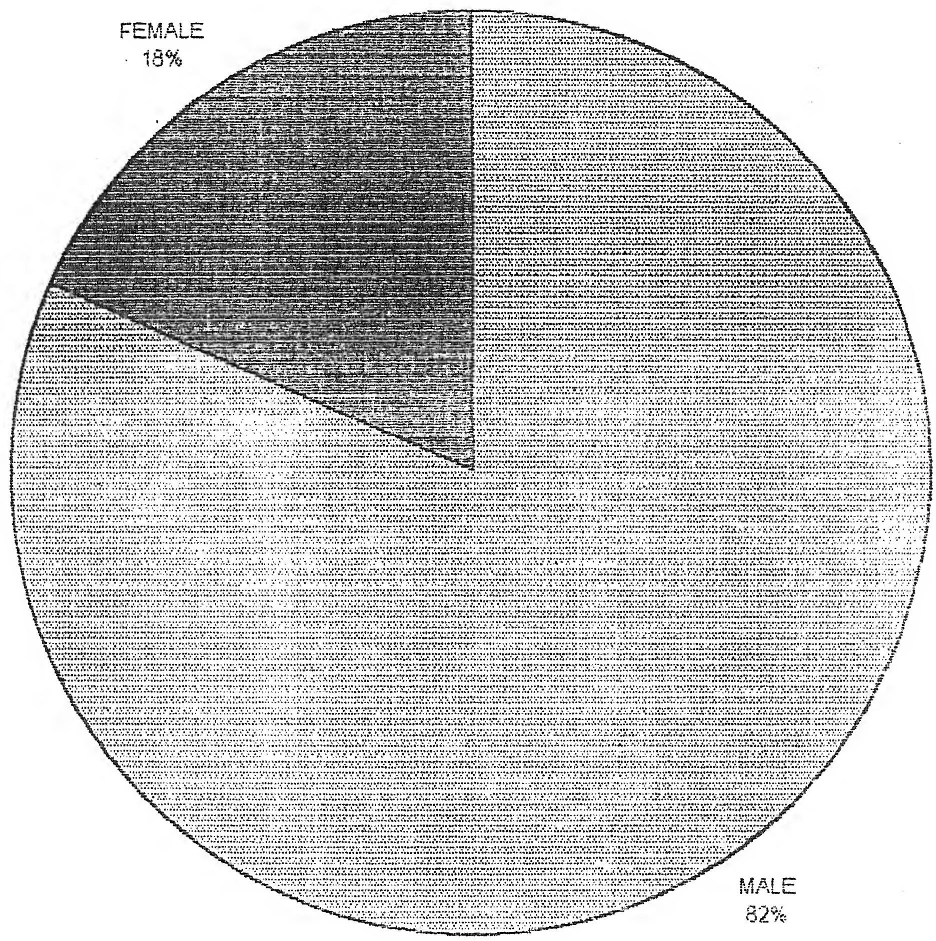


TABLE NO.3.7-> LITERACY PROGRESS



185230 were males and 32133 were females. Percentage of literate males was 29.3 and percentage of female literate was 19.3 percent.

After 10 years in 1981 the total number of literate population was 357374. Out of which 296148 were males and 61226 were females. The percentage of literate males was 36.0 and percentage of literate females was 8.6.

After 10 years in 1991 the total number of literate was 5282217. Out of which 418580 were males and 109567 were females. The percentage of male literate was 51.5 and the percentage of literate females was 16.4.

According to Economic census of 1990 table No. 3.8 shows how many people are skilled and how many are non-skilled. This table shows that there are very few industries.

C) Technical :

The wide-range disparity and low degree of education forces people in common to lead a traditional life. They do not think upon remodelling themselves through technical know has. However, some cottage industries have sprung up which are quite different from other regions such as cotton spinning, wood manufacturing, bamboo sticks moulding etc. It became possible only through respected practices.

Occupational structure of 1995 shown in table No. 3.9 clearly shows how many workers are engaged in small and cottage industries. The farmers are 49.43%, agriculture labour are 22.06%, hand craftsman are 0.48%, labour employed in cottage and small industries are 1.04%, labour not employed in cottage industry are 1.23%, labour employed in other subsidiary industries are 0.56% and others are 25.22%.

The technical workers here are 28.53%, farmers and agricultural labours are 71.49%. Thus it is clear that the industrial condition is very pitiable.

Table No. 3.8

Economic Census 1990

Sl.	Particular Items	Rural	Urban	Total
1.	Number of Industries			
	a) Agriculture	944	110	1054
	b) Non-Agriculture	14040	9611	23651
	Total	14984	9721	24705
2.	No. of Institution where Hired labourers are engaged (Agriculture + Non-Agriculture)	1939	2706	4645
3.	Number of private Industries (Agriculture + Non-Agriculture)	13045	7015	20060
4.	Workers generally employed in Industries (Non-payable and Hired worker)			
	a) Male	21869	21176	43045
	b) Female	3582	1556	5138
	Total	25451	22732	48183
5.	Permanent Labour			
	a) Male	6015	10573	16588
	b) female	753	680	1433
	Total	6768	11253	18021

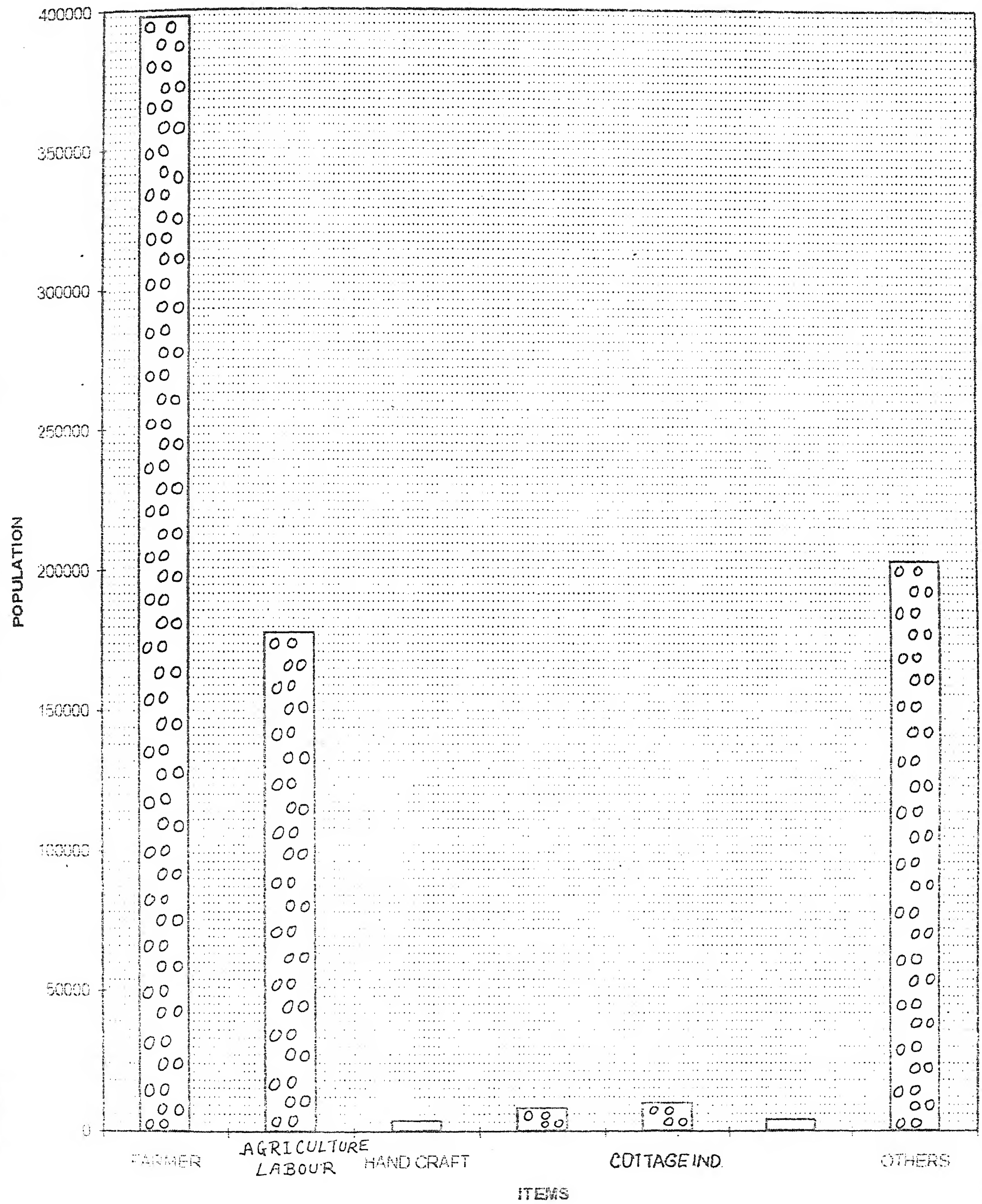
Table No. 3.9

Occupational Structure 1995

Sl.No.	Items	Population	%age
1.	Farmer (Small & marginal are included in it)	3,97,579	49.43%
2.	Agriculture Labour	1,77,440	22.06%
3.	Hand Craftsman	3,921	0.48%
4.	Labour employed in cottage and small industries	8,366	1.04%
5.	Labour not employed in cottage Industry	9,921	1.23%
6.	Labour employed in other subsidiary industries	4,236	0.56%
7.	Others	2,02,842	25.22%
	Total	8,04,311	100.00

Source : Probable Credit Plan 1995-96 Distt. Banda (U.P.) Publication, National Agriculture & Rural Development Bank, Regional Office Lucknow.

TABLE NO 3.9 -> OCCUPATIONAL STRUCTURE



ii) **Natural :**

a) **Soil :**

India's greatest single asset is its land. The bulk of its population is still engaged in agriculture and higher crop yields are essential to reduce poverty and raise living standards. Unfortunately we are currently following faulty policies that are leading to the steady deterioration of soil quality. This is slow suicide. To maintain soil quality, farmers need to apply nutrients like nitrogen, phosphorus and postassium in the form of manure and chemical fertilizers. In Banda District, soil is of extreme nature. In some areas it is very dry and in the others it is wet. Four types of soil are available here :

1) **Kabar Soil :**

Kabar soil is black in colour but it is hard in texture. Just as the rainy season is over it gets hardened and thus difficult to be ploughed. Water is found on its surface. In this soil the use of dung manure and chemical fertilizers gives good production. This type of soil is found mostly in Naraini and Baberu block. In Banda district the area of such type of soil is 88092 hectare.

2) **Rakar Soil :**

Rakar is the poorest soil mixed with stone pebbles and generally found near the river eroded parts. Kharif crops like Jwar and Bajra can be raised on such soils. The soil is stony. It has less power of absorbing water. In rainy season such types of crops as Arhar, Maize, Jwar are produced. Such type of soil is found mostly in Mau, Karwi and Naraini Blocks. In the district

the area of such soil is 27972 hectare.

3) Padua Soil :

This soil is loamy, light and of yellow colour. This requires good amount of irrigation for raising good crops. All types of crops can be raised on this soil successfully with the help of irrigation and application of manures and fertilizers. Such soil has less capacity of absorbing water. Fertility is found on its upper surface in good quantity. It is useful for raising the crops of oil seeds and Rabi. Such type of soil is found mostly in Jaspura, Tindwari, Pahari, Baberu and Ram Nagar blocks. The area of this soil is 210348 hectare.

4) Mar Soil :

This soil also is black in colour and is calcareous in nature and has a good moisture retention capacity. This is very fertile so good crops of wheat and gram can be raised even in the absence of manure.

Such soil is mostly found in Kamasin, Baberu, Bisanda, Naraini, Karwi, Mau and Barokhar, block. Phosphorous is found in it in large quantity. Where as potash is found less in quantity. If it is irrigated in time, the production of paddy, oil seeds and wheat can be had in good quantity. The area of this soil is 1727996 hectare.

b) Water :

There are different natural resources of Water-Rivers, water falls, tanks etc. District Banda is situated between River Yamuna and the chain of Vindhyachal hills. Leaving some part of it the rest of it is high, low and hilly. In the district most of the rivers are rainfed. Either

they dry up completely or partly, in the summer season. Though many rivers flow in the district yet the area is drought prone. The rivers are Yamuna, Ken Bange, Mandakini (Payaswani) Ohan, Gunta, Chandrawali and Gadra. River Yamuna's origin is from Yamunotri in the Himalaya mountain. It enters the district flowing between Hamirpur and Fatehpur. The second largest river is Ken. It does not dry. There is water in it throughout the year. A large area of the district is irrigated by canal water from Ken. This river's origin is Vindhyachal hills near Deorinagar in Damoh district. It enters the district near village Kartal. On the banks of it are Bilharka, Barsanda, Manpur, Lahurehta, Acchraur, Khaptiha Kala, Pailani and Chilla. It joins river Yamuna at chilla. River Bange originates from Vindhyachal hills in Panna district. It joins Yamuna near Vilasgram. On the bank of it are situated Ram Nagar, Bharatpur, Gurha Kala, Badausa and Mahuta. This is a hilly river. It is flooded in rainy season and there is shortage of water for the rest of the days. River Mandakini too originates from Vindhyachal range. It is a pious river. Its another name is Payaswani. On the banks of it are situated many holy places namely Attri. Anusuiya a Ashram, Isfatik Shila, Pramod Van, Sri Ram Ghat, Karur, and Sitapur Ohan River originates from Dadri village. It is the main river in Patha area. Bahilpurwa and Aichwara are the main villages on its banks.

Gunta River- It is a nallah which originates from near Rewa, Many nullahs join it and give it the form of a river. Mau, Baruwa, Raipura etc. are situated on its banks. It joins river Yamuna near Tirmau : Chandrawali river originates from Chanda village as a nullah but some other nullahs join it and give it the form of a river. It joins river ken near Pailani. On the banks of it are situated Gadaria,

Gauri Kala, Amara, Madadeo, Padohera and Pailani. Gadra is a small rainfed nullah. But in the rainy season many nullahs join it and turn it into a river.

Water of Ken river is well utilized through canal system which irrigates a major portion of the area under irrigation in the district. The water of other rivers has not so far been utilized for lift irrigation. Since the rainfall in the district is not sufficient for raising crops Bundhies and tanks are in use for moisture to raise agriculture crops specially in Patha area of the district. There are proposals for more lift irrigation schemes to utilize water of river Payaswani, Balmiki Bagain and Yamuna rivers. Generally a pucca dam wall is constructed in the rainy season nullahs or on perennial rivers like Payaswani and Bagain. In areas like "Patha" of the district the best way of utilizing surface water is to collect it at a convenient height by constructing suitable water reservoirs to store water, sufficient to irrigate about 500-600 hectares of land. The pumping is done from the nullahs by checking the flow after constructing dam on such nullahs.

The area downward of the dam of the nullah is utilized for raising paddy crop by utilizing overflow of the nullah while higher areas are irrigated from the storage tanks filled with the water of the nullah in rainy season. There are water falls in Kalinjar and Jaspura. Their waters are utilized for the welfare of the people.

We have already seen that Yamuna, Ken, Bagain and Payaswani area the perennial rivers of the district while three monsoon fed nullahs Gunta, Baruwa and Bardaha nullah are other sources of surface water in the district.

c) Minerals/Forests :

The district of Banda is clearly divided into two natural parts viz; Patha and Alluvial land. The former is

a part of Vindhya Plateau covering Mau and Karur tahsils of the district. Kaimur range passes through this part. It is rocky and covered with forest, bushes, grasses and is drought prone. In the total reported area the forests cover 77781.67 hectares of land which is 9.96% percent of the total reported area.

Chitrakoot is one of the blocks of karwi tahsil. It is rich in forests and minerals. Tendu leaves are found in the forest areas of Mau and Karwi Tahsils. So this block gives opportunity of setting of units in villages for Biri making as tendu Leaves are used in biri making. About 1.50 lacks of bags of 'Tendu leaves' are produced which are exported by forest contractors out of the district. Besides this, forest based industries like wooden toy making and bamboo basket making are established. In chitrakoot, wooden toys and different wooden articles are prepared and exported. These can be a good source of income to the weaker section.

As the Patha area is rocky the minerals found here also give employment to the people. The flat stone slabs used for roofing of the building and stone grits for road making and stone meant for images is found here. These occupations can give employment to the people of Patha area. Mau and Karwi tahsils are covered with forests. The trees are not too high. In the valley area mostly Mahua, Karil, Karaunda, Sahjan, Ingota and dDhak trees are found. In patha area the forests of Mahua, Tendu, Dhak, Achar and bamboo are found . As the area is rocky, minerals are found here in abundance. Among the minerals are Granite (hard stone), stones used for constructing buildings, Sulemani stone, white stone, silica sand, lime of white stone, sand, yellow soil. On the banks of river Ken 'Agate' (Shazar) stone is found in which natural scenery are to be seen. The sand of river

Ken etc. is used for constructing buildings.

In Pahari block there is no industry worth the name. At a number of places only hand fans and Chatai are made from the leaves of date trees.

Manikpur block is also point of 'Patha area'. As this block is a part of the rocky area, means of irrigation are lacking. Hence the block is economically backward. Good minerals and forest wealth is available in this block. 'Tendu leaves' used in the manufacturing of Biri are produced in the nearby forests worth about 50 to 60 Rs. lacks but the entire quantity produced here goes to outside places. The Tendu leaves can be a good source of income for the local people if biri manufacturing is started in the area on cottage basis. At present they are exported by outsiders.

The local forests produce Chirounji, Kattha. The local tribes are employed to collect chirounji and manufacture Kattha. Cooperatives of tribes should be organised for collection of fire wood a forest produce. They must be entrusted the work of collecting forest produce. Articles of bamboo, baskets and other bamboo articles like toys and some fancy goods can also be produced on a large part of the area if marketing and training of product of the area is taken up seriously.

Stone quarries also exist in the block hence this source can also be exploited for the good of the area. Area of Ram Nagar Block is rocky and lacks good roads. A unit for stone crushing should be set up in the block and construction of metalled link village roads be taken up so that the villages may be connected through such roads with main roads.

In Bargarh, Bhaunri white sand is found which is used in manufacturing glass.

Institutional :

Agriculture is the major occupation of the rural households. With all the industrial progress recorded, especially since the era of economic planning commenced in the country, the fact remains that as yet nearly 70 percent of the work force in the country is engaged in agricultural occupations.

In Banda district, agriculture is carried on still largely in the traditional way. The land holdings are small and scattered. Agricultural operations in part of the district are still dependent upon rainfall which is precarious. Agriculture is subject to special handicaps arising on account of unfavourable climate or rainfall, various pests and diseases. Because of difference in location and fertility, proper valuation of land raises complications. Capital works such as wells and embarkment may or may not prove productive as expected. All this amounts to saying that acceptance of land as security against which loans can be granted poses serious problems. Majority of rural house holds have hardly any savings or assets excepting land which can be offered as security against loans.

Traditionally it has been found that agriculturists who are in need of loans find it difficult to establish financial contacts with modern type commercial banks. This is because the land which is often the only security which agriculturists can offer, is generally found unsuitable by commercial banks because of difficulties of valuation of land, frequent absence of clean title deeds of rights, disputes among relatives going on in civil courts in regard to title of ownership of lands and so on. On all these counts, commercial banks hesitate to accept land as security against loans as land is a fairly liquid asset which can not be easily disposed off in the market if loans are

not repaid in time or prove bad debts.

For an agricultural revolution which has to be brought about, an appropriate and organisational structure has to be created. This requires that adequate credit should be made available for investment needs. So far, the arrangements are lagging much behind the requirements. One important significant feature of agricultural credit in India is the over whelming importance of credit available from traditional source- comprising the money lenders, merchants and individuals. This non institutional credit has not proved beneficial to the farmer as it hardly provides any incentive to affect improvement of the land. The credit provided by private agencies is mostly unproductive. The development of institutional credit is a basic condition for agricultural progress. The history of agricultural development in all advance country shows that an integrated system of institutional credit laid the foundation of agriculture. The objective of the international credit is to make a break through in the vicious circle of poverty, reek renting, usury and debt and to stimulate the farmer to boost agriculture productivity. This would rather mean in the words of Balshow- "The conversion of static into dynamic credit."

These institutional bodies are expected to do the following functions :

i) To facilitate and encourage savings and their mobilisation for productive investment.

ii) To reduce the cost of credit administration,

iii)To pool the risk of lenders.

iv) To increase competition between private money lenders and effectively counter the local monopolies which many of them now enjoy.

v) To help farm families to fully understand the opportunities which a wise use of credit would

provide together with flexible repayment provisions; and

vi) To minimise the risk of losses by borrowers.

In Banda district under the supervision of top ranking Allahabad Bank- 30 branches of commercial banks 20 branches of cooperative banks and branches of agricultural and rural development banks are contributing their cooperation.

They are whole heartedly fulfilling the needs of all the urban and rural citizens of their respective areas.

The important points of annual credit scheme for the year 1996-97 are as follows :

1) The total annual credit scheme for the district is Rs. 2480.86 lacs.

i) Rs. 225046000 allotted to fulfil the necessities of service sector which is 90.71 percent of the whole scheme.

ii) Rs. 23040000 have been allotted to fulfil the needs of urban sector which is 9.29 percent of the whole scheme.

2) Under the annual scheme of the district.

i) Rs. 1801.79 lac i.e. 72.63 percent agriculture area.

ii) Rs. 194 lac i.e. 7.85 percent area of small industry.

iii)Rs. 484.36 lac i.e. 19.52 percent have been allotted for commercial scheme.

Under the scheme organized by different states for the year 1996-97 Rs. 745.41 lacks, have been spent for the scheme made by the administration of the district and the branches of different Banks.

These figures have been taken from 'Annual Credit Plan for 1996-97 Banda district by Allahabad Bank, Table No. 3.10

Table No. 3.10

Annual Credit Plan 1996-97

S.No.	Name of Banks	IRDP (Rs. lac)	S.C.P. No.	SLRP No.	PMRY No.	SUME No.	OBC MM (No)	MINO RITY CMM (No)	KVIC (No.)	PMILUPED (No.)
1.	Allahabad Bank	146.67	275	1060	190	200	26	18	36	20
2.	State Bank of India	59.68	143	297	90	48	12	06	14	20
3.	Central Bank	36.66	77	149	40	-	07	04	03	20
4.	Punjab National Bank	8.80	55	66	30	-	05	04	03	20
5.	Union Bank	8.80	55	66	30	-	09	04	02	20
6.	Bank of Barouda	8.80	55	66	30	-	05	07	03	20
7.	Tulsi Gramin Bank	300.00	-	-	-	-	-	-	-	
8.	District Co-operative Society	25.00	-	-	-	-	-	-		
9.	Agriculture and Rural Development	160.00	-	-	-	-	-	-	-	-
10.	Total	745.41	660	1704	410	248	64	43	61	120

Source : Annual Credit Plan 1996-97 Banda district Allahabad Bank

Chapter- IV

A) Agricultural Patterns :

i) Land Use Pattern :

In Indian culture, it is rather the way of life which predicts and determines foregoing farming activities. The land use pattern means the use and distribution of available land for different purposes. Table No. 4.1 gives land utilisation statistics for the Banda District.

Table No. 4.1 shows that the total reported area of the district is 780786.33 hectare. Out of this 82210.67 hectares are not available for cultivation which is 10.53 percent of the total reported area. Area under user and unculturable land is 36690.00 hectares and 45520.67 hectares respectively. The net cultivated area is 509039.33 hectares which is 65.20 percent of the total reported area of the district. The forest area is 77781.67 hectares which is 9.96 percent of the total reported area. The culturable waste area is 32641.67 hectares which is 4.18 percent of the total reported area. Meadows & area under gardens are 429.33 hectare and 8990 hectares which is 0.06 and 1.15 percent of the total reported area respectively.

Out of the Gross cultivated area Rabi covers 391223.00 hectare, kharif covers 208490.00 hectares and zaid covers 974.33 hectares which is 65.13 percent, 34.71 percent, 0.16 percent of the gross cultivated area respectively.

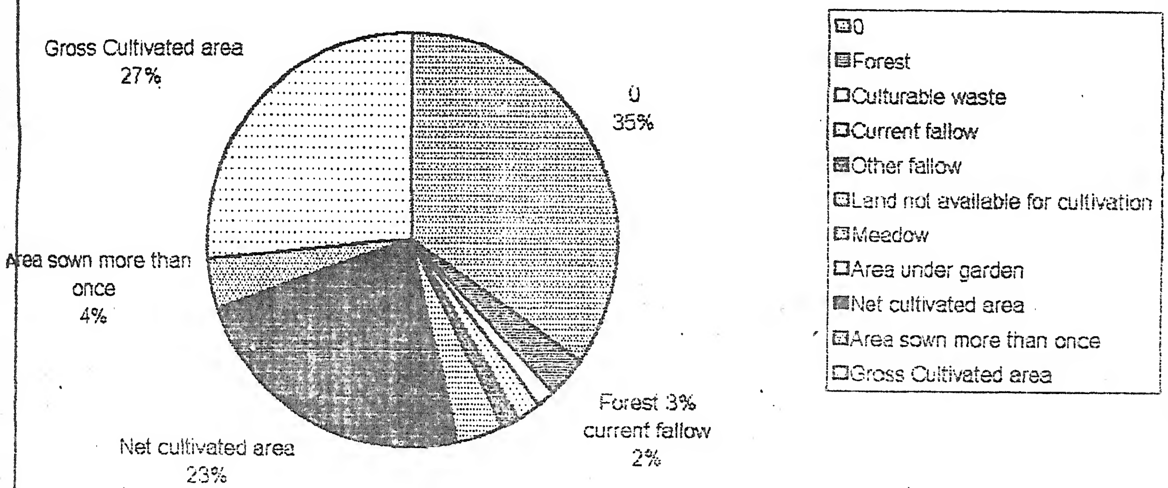
This clearly indicates that agricultural cultivation is still of growing concern among various phases of Economic

Table No. 4.1
Land Use Pattern
(Based on the average of 1992-93 to 1994-95)

Sl. No.	Particulars	Area in hec.	%age to total Rep. Area
1.	Total Reported Area	780786.33	100.00%
2.	Forest	77781.67	9.96%
3.	Culturable waste	32641.67	4.18%
4.	fallow Land		
	a) Current fallow	42894.33	5.49%
	b) Other fallow	26799.33	3.43%
5.	Land not available for cultivation :		
	a) User land or unculturable land	36690.00	4.70%
	b) Land under uses other than agriculture	45520.67	5.83%
6.	Meadows	429.33	0.06%
7.	Area under gardens	8990.00	1.15%
8.	Net cultivated area	509039.33	65.20%
9.	Area sown more than once	89328.67	
10.	Total	600687.67	100.00
	Gross Cultivated Area :		
	a) Rabi	391223.00	65.13%
	b) Kharif	208490.33	34.71%
	c) Zaid	974.33	0.16%
	Grand Total		100.00

Source : District Statistical Magazine, 1996

TABLE NO-4.1-> LAND USE PATTERN



development of the district.

Land Holdings :

The size of holdings is the operational unit of cultivation. This is one of the important ingredients which affects farming and return from agriculture. The productivity of small and holdings fragmented holdings naturally becomes very low. The distribution of land holdings according to 1991 is as follows :

Table No. 4.2 disclosed an alarming picture of the holdings in the district. The number of operation holdings in the size below 0.5 hectare is the largest one which is 33.71 percent of the total holdings while the lowest number occurs in the size above 10 hectares, only 1.14 percent of the total holdings. It is a remarkable factor that the highest number of holdings group has only 9.45 percent of the total operational area and lowest number of holdings group has higher i.e. 40.55 percent of the total operational area. Holdings between 0.5 to 1.0 hectare are only 24.92 percent and operational area covered by them comes to 12.62 percent of the total area. Holdings between 1 to 2 hectare are only 21.34 percent and operational area covered by them comes to 24.91 percent of the total area. Holdings 2 to 4 hectare are only 11.03 percent and operational area covered by them comes to 2.56 percent of the total area. Holdings between 4 to 10 hectare size group accounted 7.86 percent which covered 40.55 percent of the total area.

This means that the district has large number of small and marginal farmers and very few large farmers. A picture of unequal distribution of land is leading to disparity and dividing the agricultural society between haves and have-nots.

Table No. 4.2

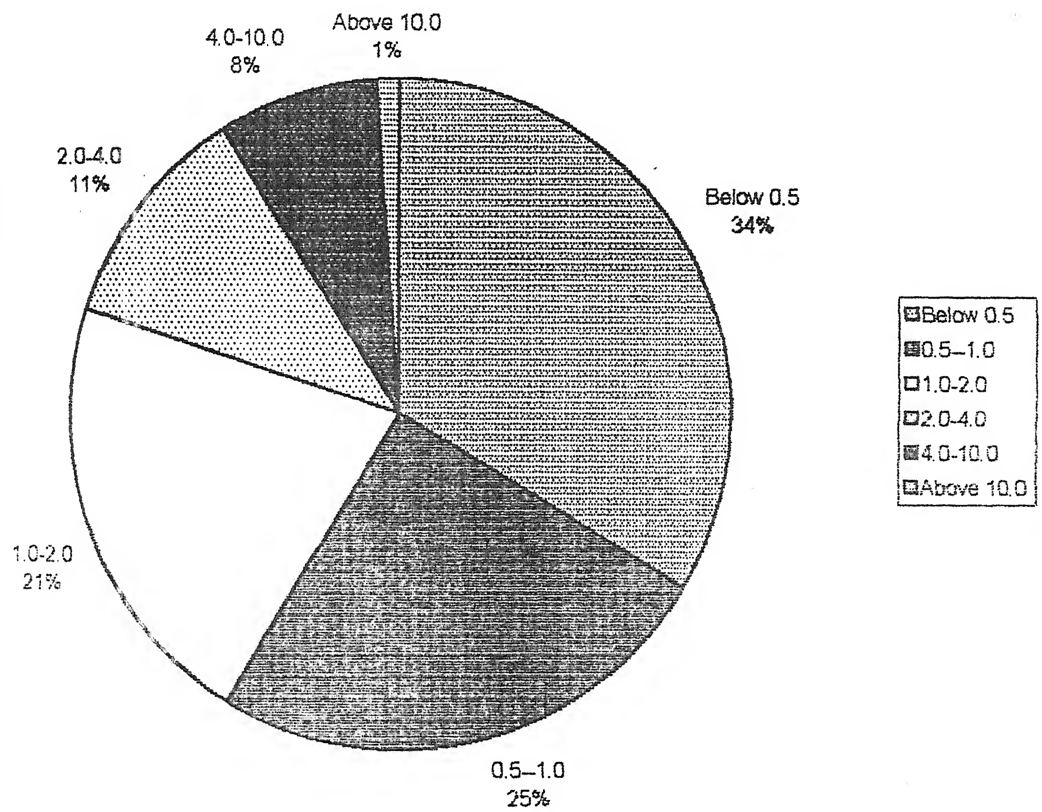
Sizewise Holdings of the District 1991 (in hec.)

Size of holding (in hect.)	No. of	Percentage	Total area of the hold-ings (in hec.)	Percen
below 0.5	118358	33.71%	40295	9
0.5-10	87508	24.92%	53874	12
1.0-2.0	74936	21.34%	106328	24
2.0-4.0	38786	11.03%	10910	2
4.0-10.0	27598	7.86	173037	40
Above 10.0	4005	1.14	42296	9.
Total	351151	100.00	4267740	10

Source : Bulletin of Agricultural Statistics,

TABLE NO. 4.2 - SIZEWISE HOLDINGS OF THE DISTRICT

1991 (IN Hec.)



Cropping Intensity :

The cropping intensity presents the workable value of farm development and the potential value of farming activity i.e. the cropping performance of the farmers.

The crop intensity of Banda district from 1980-81 to 1994-95 is given as follows :

The cropping intensity of 1980-81 was 120.12 percent. It decreased in 1981-82. But in 1982-83 it showed remarkable progress that it reached upto 128.84 percent. After this it began to decrease upto 1985-86. In 1980-87 it increased again so as to reach upto 120.39 percent. In 1987-88 it declined too much. It came down to 111.67 percent. After this went on increasing gradually and showed uneven progress upto 1993-94. In 1994-95 it increased upto 119.68 It has been shown in the table number- 4.3.

Growth Percentage of Total Cropped Area :

Supposing the year 1980-81 as base year the percentage of the growth of the cropped area of coming years has been found out from 1981-82 to 1982-83 it in creased From 1983-84 to 1984-85 it decreased. Again in 1985-86 and 1986-87 it increased. But in 1987-88 it decreased so much that it fell down to 96.15 percent. In 1990-91 the increase was 103.75 percent. In 1991-92 again it decreased 98.46 percent. The reason of this was the floods in the district. In 1992-93 the increase was 102.06 percent. In 1993-94 it again decreased. In 1994-95 the increase was 104.08 percent. It has been shown in the table No. 4.4

Such conditions are not good from Economic point of view. So much of fluctuation and vibration is very harmful for the development of the country.

Growth Percentage of Net Cropped Area :

Supposing the year 1980-81 as base year the growth percentage of the net cropped area has been worked out.

Table No. 4.3
Cropping Intensity

Sl.No.	Year	Cropping intensity (%)
1.	1980-81	120.12
2.	1981-82	118.49
3.	1982-83	128.84
4.	1983-84	119.28
5.	1984-85	116.19
6.	1985-86	117.65
7.	1986-87	120.39
8.	1987-88	111.67
9.	1988-89	116.43
10.	1989-90	115.38
11.	1990-91	117.44
12.	1991-92	116.42
13.	1992-93	118.77
14.	1993-94	116.44
15.	1994-95	119.68

Source : Bulletin of Ag. Statistics, Directorate of Ag. U.P. Lucknow

TABLE NO.4.3 - CROPPING INTENSITY (Percentage)

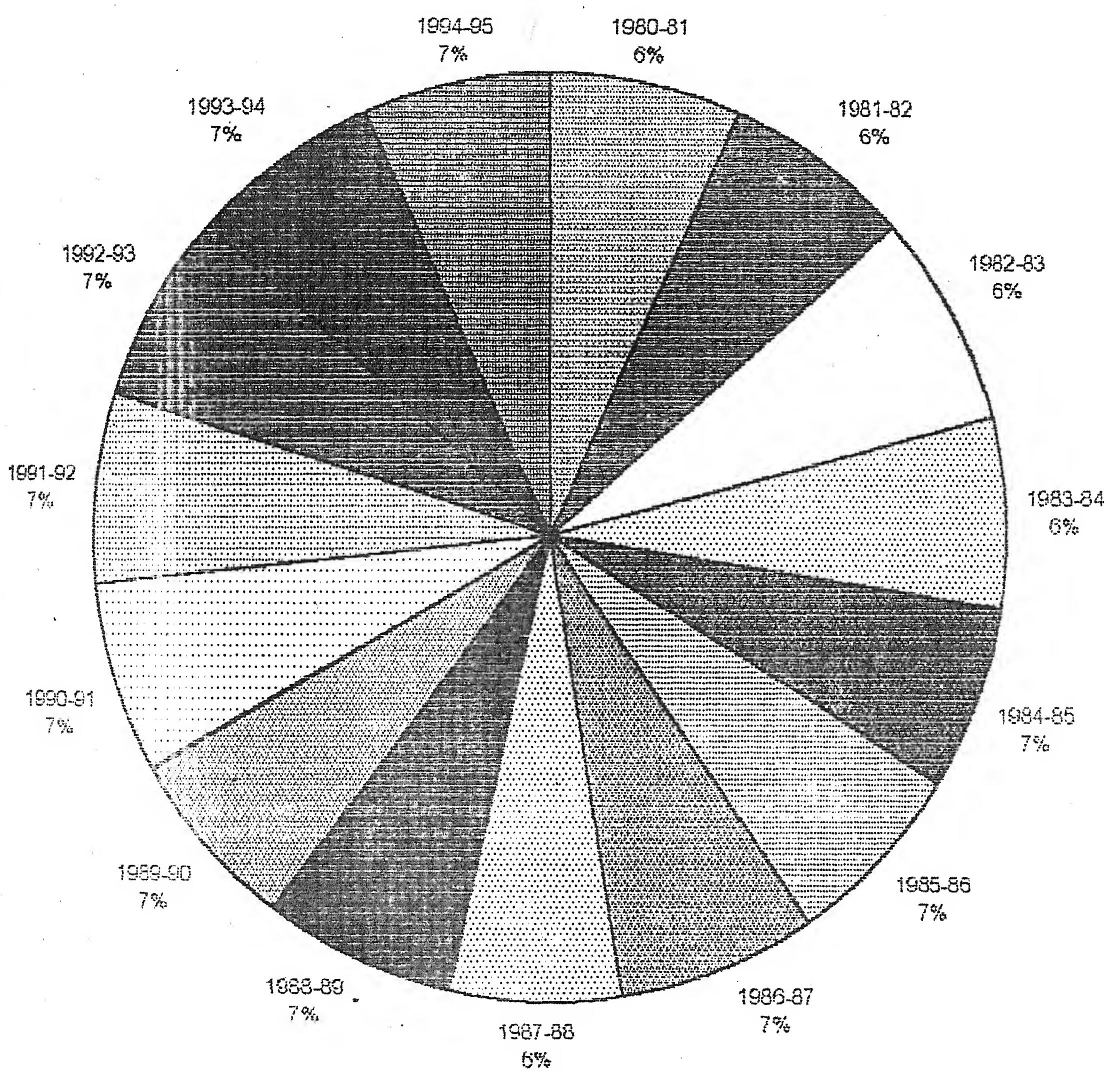
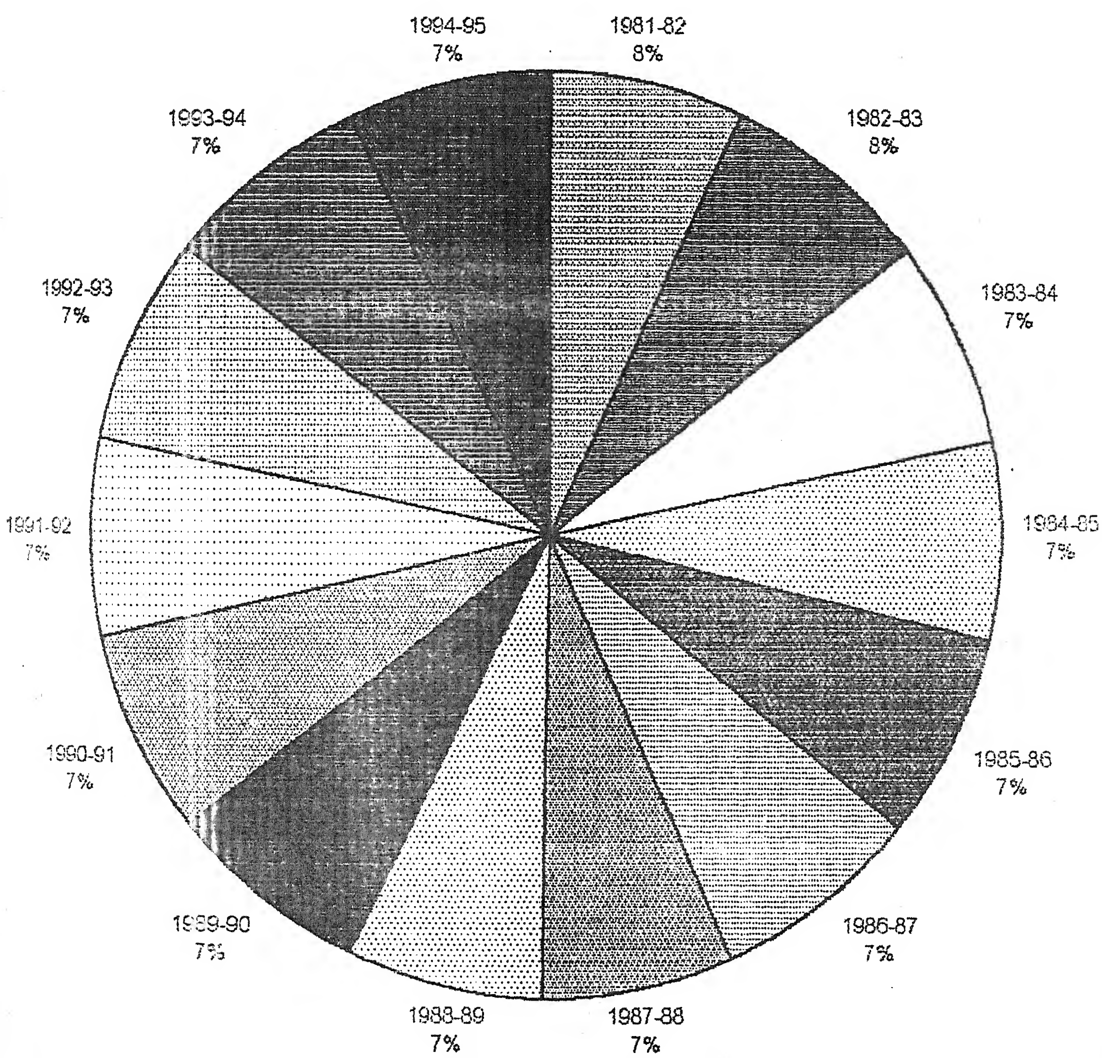


Table No. 4.4
Growth percentage of Total Cropped Area

Year	Total Cropped area (in Hec.)	Percentage of Growth
1980-81	589968	100.00
1981-82	591304	100.23
1982-83	606881	102.87
1983-84	601580	101.97
1984-85	597553	101.29
1985-86	605317	102.60
1986-87	619255	104.96
1987-88	567262	96.15
1988-89	579833	98.28
1989-90	585288	99.21
1990-91	612083	103.75
1991-92	580909	98.46
1992-93	602112	102.06
1993-94	586513	99.41
1994-95	614015	104.08

Source : Basic statistics- Directorate of Ag. U.P.

TABLE No.- 4.4- GROWTH PERCENTAGE OF TOTAL CROPPED AREA



In the year 1981-82 it increased 101.61 percent. In 1982-83 it decreased by 95.91 percent. From 1983-84 to 1986-87 it went on increasing. Again from 1987-88 to 1988-89 it decreased. In 1990-91 it attained utmost increase. This shows that this year the farmers and the government both did their best to increase the percentage of the net cropped area. Due to floods in 1991-92 there was a sufficient decrease in the percentage. Again in 1992-93 it increased by 103.22 percent. In 1993-94 it decreased again and in 1994-95 it increased by 104.77 percent. It has been shown in the table number- 4.5

The table shows that from 1980-81 to 1994-95 no effort was made by the farmers and the government both to increase the percentage. The emerging picture is hopeless and needs proper attention.

ii) Cropping pattern

The way of life, need and curiosity of growing crops as suitable to them and, the farming culture are the unique presentations of the cropping pattern. In our country there is much discrepancy of land, climate. This is why the pattern of crops changes on the basis of place and climate. Pattern of crops means, which crops and in what parts are raised in culturable land. In this way knowledge is gained about methods of cropping pattern in district, state and country. Method of cropping gives knowledge of the pattern of crops so as we come to know that in our country, state or district, what crops the farmers are interested to raise.

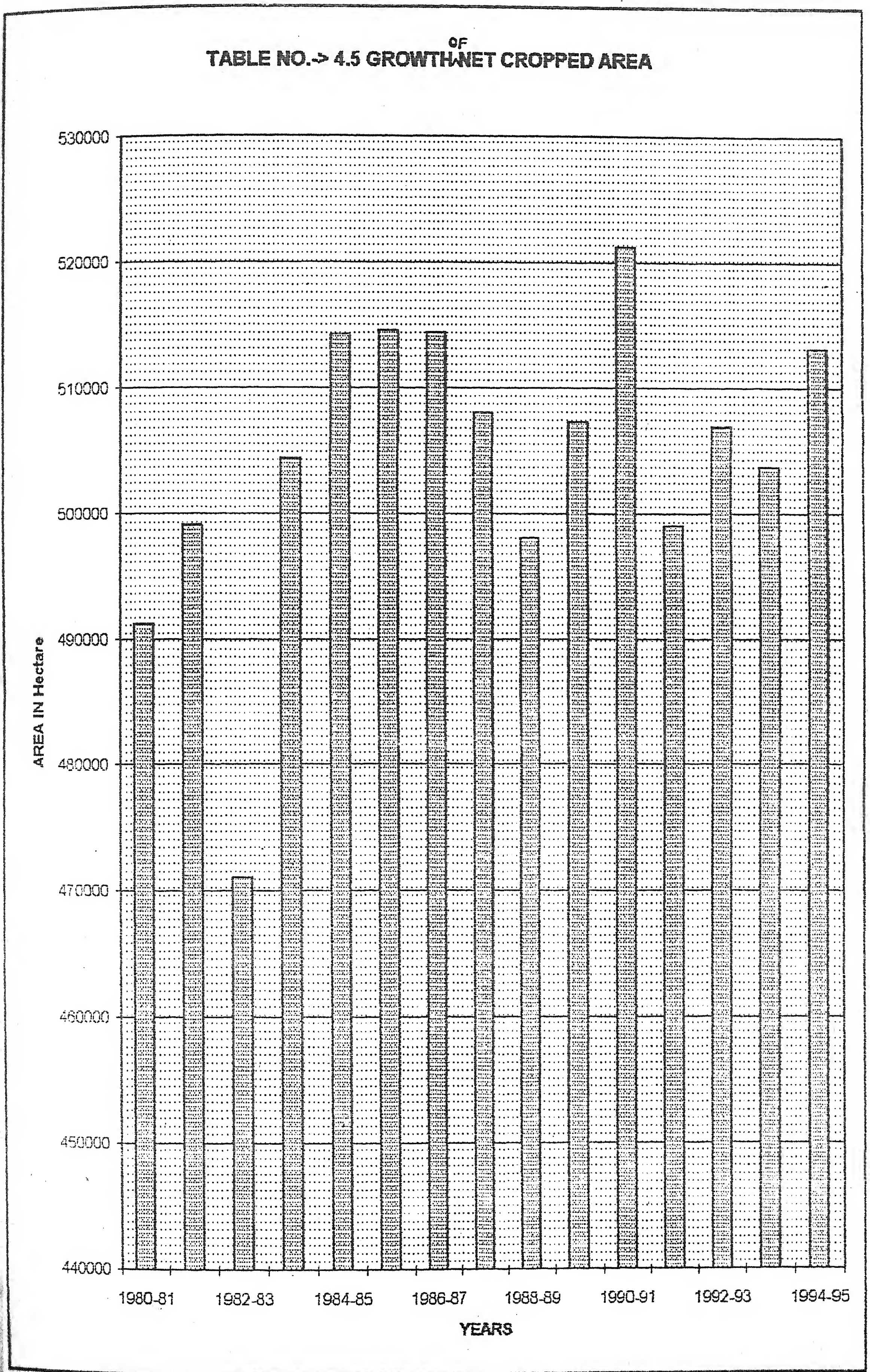
If in the country, state or district much foodgrains are produced, the farmers take much interest in the production of foodgrains that is they give first place to consumption. In the same way if occupational crops are produced more, the farmers of that place give importance to occupational crop. In occupational crops, the production

Table No. 4.5

Growth percentage of Net Cropped Area

Year	Net Cropped. Area	Percentage Growth
1980-81	491131	100.00
1981-82	499024	101.61
1982-83	471021	95.91
1983-84	504348	102.69
1984-85	514292	104.72
1985-86	514522	104.76
1986-87	514360	104.73
1987-88	507986	103.43
1988-89	498002	101.41
1989-90	507288	103.29
1990-91	521192	106.12
1991-92	498980	101.59
1992-93	506946	103.22
1993-94	503694	102.56
1994-95	513068	104.47

Source : Basic Statistics- Directorate of Ag. U.P.



OF
TABLE NO.-> 4.5 GROWTH NET CROPPED AREA
530000
520000
510000
500000
490000
480000
470000
460000
450000
440000
AREA IN Hectare
1980-81
1982-83
1984-85
1986-87
1988-89
1990-91
1992-93
1994-95
YEARS

of joot and kapas is much less. The farmers of the district raise mixed crop of pulses and oilseeds.

The land under study covered by food-grains 341845 hectare is 56.91 percent of the total land. In these crops wheat comes first which covers 190830 hectare of land which is 31.77 percent of total foodgrains area. In the second place comes gram which covers 149778 hectare of land which is 24.93 percent of the total area.

The area, where jwar is sown is 69634 hectare which is 11.59 percent of the total foodgrains area. In the fourth place the area where Rice is sown is 59430 hectare which is 9.90 percent of the total area.

In the district following crops come under foodgrains Rice, wheat, Barley, jwar, Bajra, Maize, Urd, Moong, Lentil, Gram, pea, Arhar and other pulses. The area, where barley, jwar bajra, Maize, Sanwa, Kodo Kakun and Kutki are sown is 7914, 11607, 02, 1202, 1082, 129, and 6 hectare respectively which is 11.32, 1.93, 0.0003, 0.20, 0.18, 0,02, 0.0009 percent of the total food grain crops. The area where other grains are sown is 3246 hectare which is 0.58 percent of the total foodgrain area.

In the district out of the total area where foodgrain crops are grown, the area covered by pulses stands on the second place. The area where gram is sown in 149778 hectare which is 24.93 percent of the total area of pulses. The area where arhar is sown is 27105 hectare which is 4.51 percent of total foodgrains area. The area sown by lentil is 39308 hectare which is 6.54 percent of total foodgrain area. In the same way the area covered by Urd, Moong, Pea and Moth is 1568, 1163, 799,12 hectare respectively which is 0.26, 0.19, 0.13, 0.002 percent of the total foodgrain area. In the district the total area where pulses are sown is 219733 hectare which is 36.58 percent of the

Table No. 4.6
Cropping Pattern

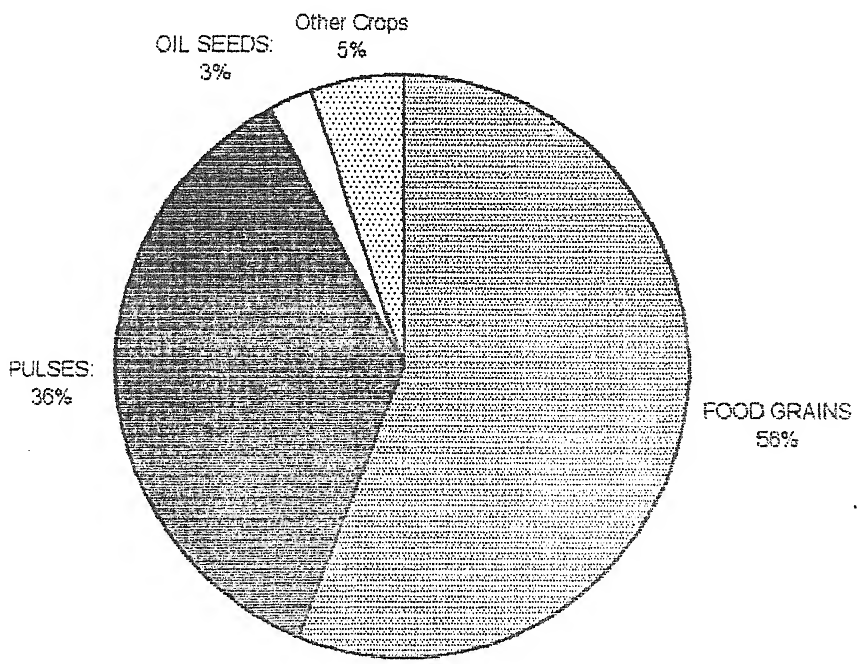
Sl.No.	Crops	Area in hec. cropped Area	Percentage of total
1-	FOOD GRAINS		
A)	Wheat	190830	31.77%
B)	Rice	59439	9.90%
C)	Barely	7914	1.32%
D)	Jwar	69634	11.59%
E)	Bajra	11607	1.93%
F)	Maize	02	000.3%
G)	Mahua	-	-
H)	Sanwa	1202	0.20%
I)	Kodo	1082	0.18%
J)	Kakun	129	0.02%
K)	Kutaki	06	0.0009%
Total of food grains		341845	56.91%
2.	PULSES		
A)	Gram	149778	24.93%
B)	Lentil	39308	6.54%
C)	Urd	1568	0.26%
D)	Moong	1163	0.19%
E)	Arhar	27105	4.51%
F)	Pea	799	0.13%
G)	Moth	12	0.002%
Total of Pulses		219733	36.58%

Continued Table 4.6 .....

3.	OIL SEEDS		
	A) Linseed	7246	1.21%
	B) Groundnut	373	0.06%
	C) Lahi/Sarson	4068	0.68%
	D) Til	1464	0.24%
	E) Arandi	22	0.004%
	F) Soyabean	2454	0.41%
	G) Sunflower	32	0.005%
Total of Oilseeds		15659	2.61%
4.	Other crops	32134	3.9%

Source : Bulletin Ag. Statistics - Directorate of Ag. Lucknow

TABLE 4.6 - CROPPING PATTERN



total foodgrain area. In the district the area where foodgrains are sown is 561578 hectare which is 33.98 percent of the total area.

In the district, out of the occupational crops, the area where Linseed is sown is 7246 hectare which is 1.21 percent of the total area, out of the oilseeds, /sarson/ Lahi covers the area of 4068 hectare which is 0.68 percent of the total area. The area sown by Arandi is 22 hectare which is 0.004 percent of the total area. The area where Til is grown is 1464 hectare which is 0.24 percent of the total area. The area where oilseeds are sown is 15659 hectare which is 2.61 percent of the total area. In the district under the other occupational crops the area of sown land is 3.9 percent. It has been shown in the table number- 4.6

iii) Production pattern

In country, state and district, Production pattern means preference should be given according to crop production of foodgrain crop of production of occupational crop and which crop is giving more production. If foodgrain crop yields more production, the farmers will give preference to their production. If oilseeds and other commercial crops yields more production, the farmers give importance to the production of commercial crops.

In the district the production of wheat, Rice, Jwar, Gram, Linseed, Arhar etc. is more in the area of research study. In the production of foodgrains, wheat occupies first place. In the district the production of wheat is 242727.66 metric ton which is 46.13 percent of total production. In the production of food grain the production of Rice occupies second place. The production of Rice is 62229.333 metric ton which is 11.83 percent of total production. In the production of foodgrains the production of gram occupies

Table No. 4.7
Production Pattern

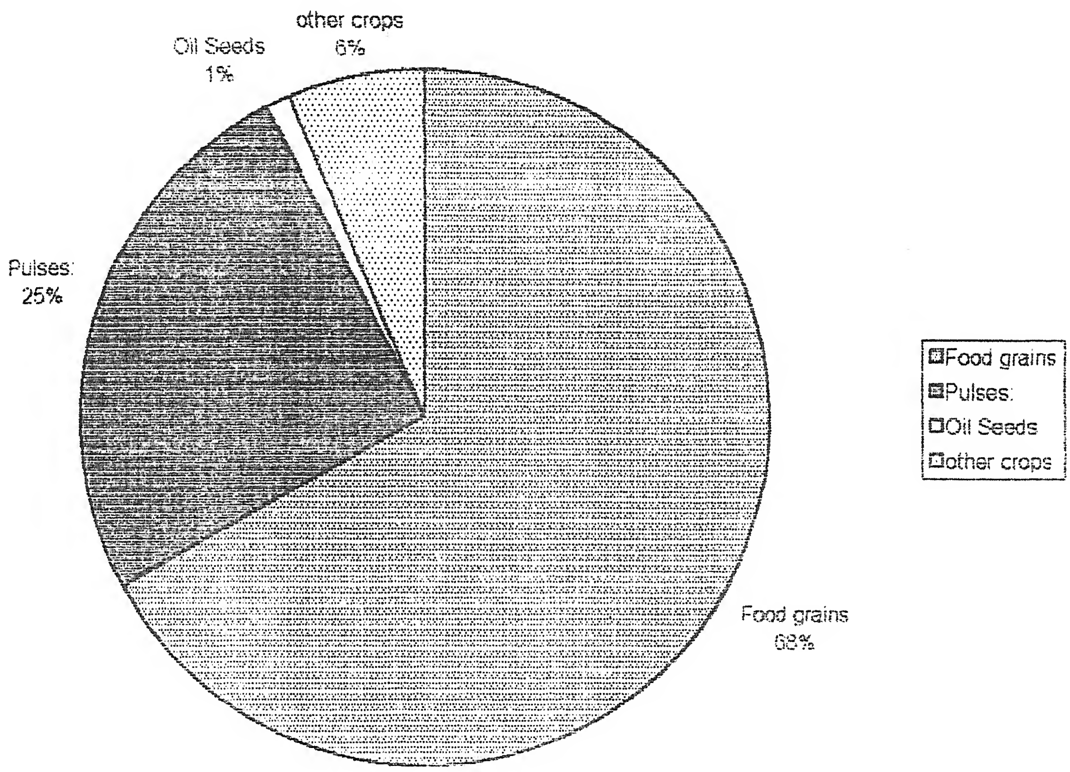
Sl.No.	Crops	Production in Metricton	Percentage
1.	Food Grain		
	A) Wheat	242727.66	46.13
	B) Rice	62229.333	11.83
	C) Barley	13235.00	2.52
	D) Jwar	52893.666	10.05
	E) Bajra	8824.667	1.68
	F) Maize	3.667	0.0007
	G) Mahua	3.667	0.0007
	H) Sanwa	573.00	0.11
	I) Kodo	702.00	0.13
	J) Kakun	82.667	0.02
	K) Kutaki	1.00	0.0002
	Total of Food Grains	38127.633	67.06
2.	Pulses :		
	A) Gram	99192.00	18.85
	B) Lentil	26250.00	4.99
	C) Urd	630.67	0.12
	D) Moong	334.33	0.06
	E) Arhar	37966.67	7.22
	F) Pea	826.33	0.16
	G) Moth	1.67	0.0003
	Total of pulses	144868.33	25.48

continued Table 4.7 .....

3.	Oil seeds		
	A) Linseed	2340.67	40.08
	B) Groundnut	234.00	4.01
	C) Lahi/Sarson	2138.00	36.61
	D) Til	155.33	2.66
	E) Arandi	10.67	0.24
	F) Soyabean	14.00	0.24
	G) Sunflower	944.33	16.17
	Total of Oil Seeds	5840.67	1.03
4.	Other Crops	36588.666	6.44

Source : Bulletin of Ag. Statistics, Directorate of Ag. U.P., Lucknow

TABLE 4.7 - PRODUCTION PATTERN



third place. The production of gram is 99192 metric ton which is 18.55 percent of the total production. The production of Jwar, Arhar and lentil occupy fourth, fifth and sixth place respectively. In the district the production of Jwar, Arhar, Lentil and barley is 52893.666, 37966.67, 26250, 13235 metric ton respectively which is 10.05, 7.22, 4.99, 2.52 percent of the total production respectively. In the district the production of foodgrains is 381276.33 metric ton which is 67.06 percent of the total production. The production of pulses is 144868.33 metric ton which is 25.48 percent of the total production.

In the district among the production of oilseeds the production of linseed stands on the first place. The production of linseed is 2340.67 metric ton which is 40.08 percent of the total production of oilseeds. The production of Lahi/ Sarson occupies second place. The production of Lahi/Sarson is 2138 metric ton which is 36.61 percent of the total production of oilseeds. In the district Til, Arandi, groundnut, sunflower is respectively, 155.33, 10.67 234, 14.00 and 944.33 metric ton which is respectively 2.66, 0.24, 4.01, 0.24, 16.17 percent of the total production of oilseeds. In the district the total production of oil seeds in 5840.67 metric ton which is 1.03 percent of the gross production. It is clear that the production of oilseeds in the district is very low. The production of other occupational crops is very low. It has been shown in the table number- 4.7.

The production pattern as suitable to their norms of life, should be viewed thoroughly and overwhelming changes must occur.

iii) Yield pattern

The average yield of Barley, wheat, arhar, pea and sunflower is much more than the other crops. Thus there

Table No. 4.8
Yield Pattern

Sl.No.		Crop	Yield qtls. (hec.)
1.	Food Grains		
	a)	Wheat	13.00
	b)	Rice	8.86
	c)	Barley	16.26
	d)	Jwar	7.32
	e)	Bazra	6.82
	f)	Maize	5.00
	g)	Mahua	3.96
	h)	Sanwa	4.04
	i)	Kodo	5.33
	j)	Kakun	5.55
	k)	Kutaki	2.94
	Total of Food Grains		9.63
2.	Pulses :		
	a)	Gram	6.78
	b)	Lentil	7.04
	c)	Urd	3.89
	d)	Moong	2.99
	e)	Arhar	13.82
	f)	Pea	12.13
	g)	Moth	2.38
	Total of Pulses		8.54

Continued Table 4.8 .....

3.	Oil seeds :		
	a)	Linseed	3.55
	b)	Groundnut	8.72
	c)	Lahi/Sarson	5.43
	d)	Til	1.19
	e)	Arandi	6.08
	f)	Soyabean	6.36
	g)	Sunflower	11.07
	Total of Oil Seeds		4.12

Source : Bulletin of Ag. Statistics, Directorate of Ag., U.P. Lucknow.

is scope for raising the yield per hectare in other crops which requires concrete efforts to increase area under irrigation and application of fertilizers besides use of other agricultural inputs like seed of high yielding varieties etc.

As the table shows that among foodgrains the average of barley is much higher (16.26 percent) so it stands on the first place. The percentage of wheat is also good. It is 13.00 percent. It occupies second place. Among the pulses comes the production of Arhar and pea, which stand on the third and fourth place respectively. Among oilseeds the production of sunflower is good. It occupies fifth place.

The table No. 4.8 shows clearly the position of the percentage of other foodgrains, pulses and oilseeds.

For increasing the yield, the much more useful farming practices may be adopted on war level.

B) Adoption of H.Y.V. Programme :

Green Revolution indicates the increase in agricultural growth within a short period in the middle of sixth decade as a result of using seeds of high yielding varieties and new techniques of chemical fertilizers.

In order to make the combination of the seeds of high yielding varieties and chemical fertilizer successful, other required seeds are also collected. The programme of using all these things combindly to increase production is called collective programme (Ek Musht Karya-kram).

A major contribution of the high yielding varieties programme is the interest it has awakened among the farmers to depend on certified seeds as an important input to increase their production. The growth of the seed industry was rather slow in the initial stages from 1963 to 1965. There was then a rapid expansion from 1966 to 1969. However, the phase of rapid growth proved to be a short lived

phenomena. In 1969 and 1970 the accumulation of excess or unsold selects of hybrid jwar and maize resulted in huge storage losses to the seed agencies and reduced seed production. This situation attracted the attention of the leading Economists in the country.

A.M. Khusro pointed out that "as for high yielding varieties they were not there until the other day and such improved varieties that did not exist were not in good demand."

Many factors affect the rate of growth and expansion of the seed industry in India. For Evolution of superior crop plant varieties, trained technicians are needed who can help in the multiplication of new varieties and availability of efficient seed processing equipment that can effectively and rapidly process large quantities of seeds of several varieties.

A realistic price policy based on careful and accurate cost analysis will greatly accelerate the growth of the seed industry. The farmers' interest in such seeds should be kept up by constant efforts of the seed companies to supply high quality seed at competitive price at places within their reach. It must be recognized that a large number of progressive farmers will be attracted to growing seed in performance to commercial gains only. Seed is a perishable commodity. The measure of seed quality depends upon vigour and ability of the seed to grow and produce a good crop.

The farmers, all over the country have realised the importance of fertilizers and manures in raising the yields of the different crops, but their use is mainly dependent on the availability of irrigation water and proper distribution of annual rainfall in the area.

It is sad and unfortunate that due to small holdings

Table No. 4.9
Distribution of Fertilizer in District
(1992-93 to 1994-95)

Years/Block	Nitrogen in M.T.	Phosphorous in M.T.	Potash in M.T.	Total in M.T.
1992-93	9148	4214	92	13454
1993-94	8143	2999	102	11244
1994-95	7330	2352	175	9857
Block : 1994-95				
Jaspura	125	100	2	227
Tindwari	250	150	10	227
Barokhar	435	160	15	610
Baberu	805	180	15	1000
Kamasin	185	95	2	282
Bisanda	580	115	15	710
Mahua	530	135	15	680
Naraini	2200	605	36	2841
Pahari	250	100	5	355
Karwi	1200	250	30	1480
Manikpur	355	115	10	488
Ram Nagar	205	187	15	407
Mau	210	160	5	375
Total of Rural Area	7330	2352	175	9857
Total of Urban Area	-	-	-	-
Total of District	7330	2352	175	9857
Percent	74.36	23.86	1.78	100.00

Source : Bulletin of Ag. Statistics, Directorate of Ag., U.P.

TABLE 4.9 - DISTRIBUTION OF FERTILIZER IN DISTRICT

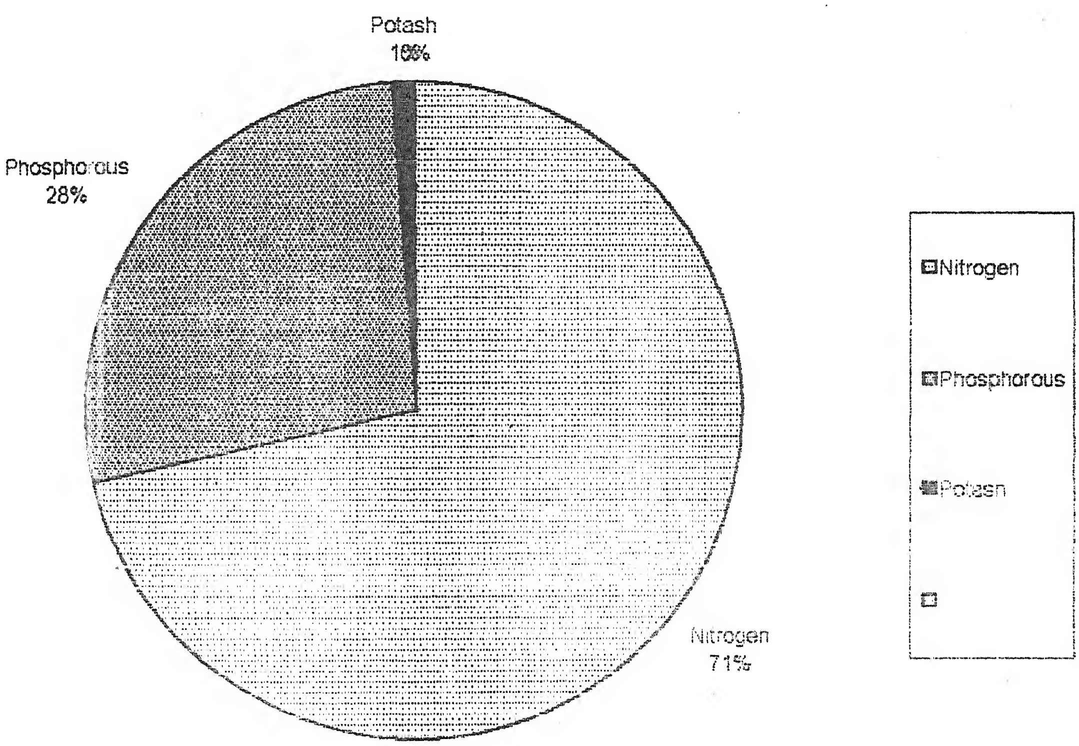


Table No. 4.10

Fertilizer Distribution by Diffrent Agencies During 1995-96 and Target Fixed for 1996-97

Name of the deptt.	Fertilizer (in qtl.)	Quantities of Fertilizer distribution during 1995-96	Target for Fertilizer distributed during 1996-97
Deptt. of Agriculture	Nitrogenous	470	580
Deptt. of Co-op	,,	5000	6500
U.P. Agro	,,	700	870
Private Agencies	,,	7130	9100
Deptt. of Agriculture	Phosphatic	420	780
Deptt. of Co-operative	,,	3060	-
U.P. Agro	,,	200	400
Private Agencies	,,	1320	2140
Deptt. of Agriculture	Potassic	80	200
Deptt. of Co-cperative	,,	90	230
U.P. Agro	,,	40	100
Private Agencies	,,	100	300

Source : The Programme of Production of Rabi Foodgrain, District Banda 1997

of land, uneven rainfall and limited irrigation facilities, poor use of chemical fertilizers and high yielding varieties of seeds play a negligible role in agriculture of the district. The distribution of fertilizers in the district is given in Table- 4.9

The position in respect of distribution of fertilizers in this district during 1995-96 and target fixed for 1996-97 is as seen in table No. 4.10

It will thus be seen that the quantities of various fertilizers distributed by agencies in the district is very poor, which is mainly due to uneven distribution and uncertain rainfall in the district besides lack of irrigation facilities for a large area.

Use of seed of high yielding variety of improved and exotic crop is the main plank of new agriculture technology. A department of agriculture is having two seed farms in the district for production of seed of high quality and the district authorities are alive to the need for distribution of seed of improved and exotic varieties of crops in the district and campaigns (Rabi and Kharif) have been started for this purpose so that larger areas could be covered under these crops.

The position in respect of distribution of H.Y.V. seeds in this district by agencies during 1995-96 and target fixed for 1996-97 is shown in table No. 4.11

e) Employment opportunities

Banda district is very backward in comparison to other districts of Uttar Pradesh. The main occupation of the people is agriculture. In this district 59.94 percent of the people are agriculturist 25.8% are labourers and 14.22 percent belong to their occupations. Table No. 4.12 can be seen. This indicates that the main source of livelihood is agriculture. In 1991 the daily income of labourers was Rs.

Table No. 4.11

H.Y.V. Seed Distribution by Different Agencies (Rabi Crops)

Crops	Quantites of seed distri bution during 1995-96	Target for seed distrubution			
		Agricul-ture (in qtl.)	Co-oper-ative (in qtl.)	Agro (in qtl.)	Total
Wheat	8206	6750	1750	500	9000
Lentil	655	660	150	-	810
Barley	20	50	-	-	50
Gram	1189	180	1100	-	1280
Linseed	24	30	-	-	30
Pea	117	130	-	-	130
Lahi/Sarson	50	75	20	-	95
Toriya	20	30	5	-	35

Source : Rabi Campaign Programme 1997 Directorate of Agriculture, U.P.

Table No. 4.12

Distribution of Workers (District and blocks)

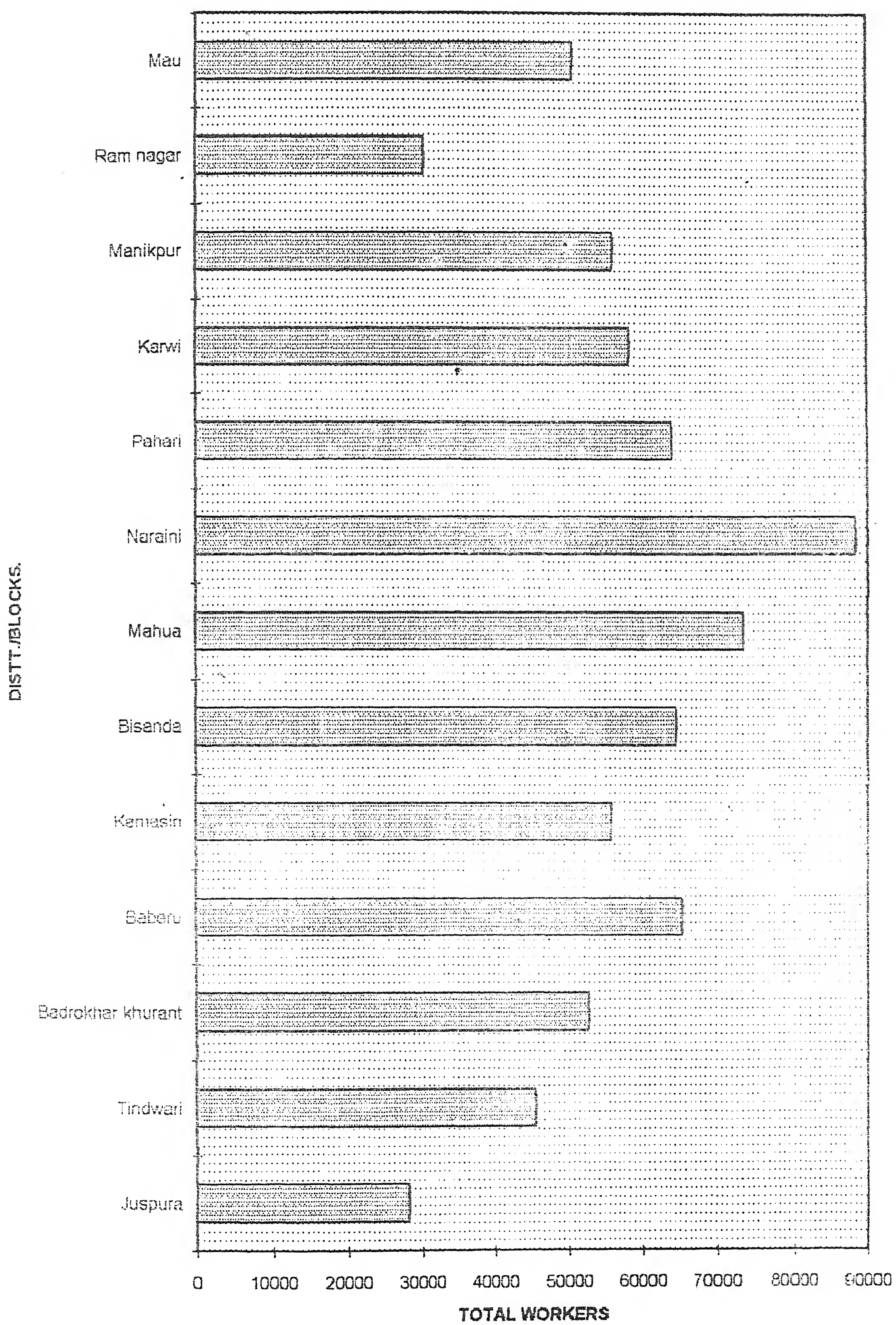
	Distt./Block	Total worker	Workers Engaged in Agriculture			Workers engaged in Agriculture total workers
			Farmers	Agriculture Labours	Total	
1.	Banda	804037	397557	177205	574762.00	71.48%
			(49.46%)	(22.04%)	(100.00%)	
2.	Jaspura	28184	14562	7517	22109	78.44%
			(51.77%)	(26.67%)	(100.00%)	
3.	Tindwari	45560	21299	13696	34995	76.81%
		(46.75%)	(30.06%)	(100.00%)		
4.	Barokhar	52787	24901	14960	39861	75.51%
		(47.17%)	(28.34%)	(100.00%)		
5.	Baberu	65423	31153	14471	45624	69.74%
		(47.62%)	(22.12%)	(100.00%)		
6.	Kamasin	55786	28600	10645	39245	70.35%
		(51.27%)	(19.08%)	(100.00%)		
7.	Bisanda	64516	31329	16420	47749	74.01%
		(48.56%)	(25.45%)	(100.00%)		
8.	Mahua	73375	33708	19862	53570	73.01%
		(45.94%)	(27.07%)	(100.00%)		

Table 4.12 Contd. ... ...

9.	Naraini	88483	51562	17800	69362	78.39%
		(58.27%)	(20.17%)	(100.00%)		
10.	Pahari	63835	36607	14661	51268	80.31%
		(57.35%)	(22.97%)	(100.00%)		
11.	Karwi	58194	36888	8387	45275	77.80%
		(63.39%)	(14.41%)	(100.00%)		
12.	Manikpur	55831	28801	14214	43015	77.05%
		(51.59%)	(25.46%)	(100.00%)		
13.	Ram Nagar	30198	17780	6004	23784	78.76%
		(58.88%)	(19.88%)	(100.00%)		
14.	Mau	50443	28553	8996	37549	74.44%
		(56.60%)	(17.83%)	(100.00%)		

Source : Census 1991

TABLE NO. - 4.12 DISTRIBUTION OF WORKERS



35/- The agriculture labourer gets employment only for 189 days in a year and the rest of the days remains unemployed. In this way in this district seasonal unemployment and disguised unemployment in agriculture prevails. A few small and cottage industries are seen. The standard of living of rural folk is very poor.

The surplus of production of food grains in the district does not in any way indicate that the Economic base of the district is sound. The condition of masses in the larger part of the area with the exception of some blocks having assured means of irrigation, is miserable and needs immediate attention. If we take into account physical features, climate, distribution of rainfall along with lack of industrial base in the rural area and poor percentage of workers, poor type of animals, in Patha area it becomes necessary to take immediate steps to improve the economic condition of the people of the district. This is a big task if tackled in a systematic way by taking up steps to improve agriculture set up, agro based forest based, mineral based industries in the district and motivate the prospective artisans etc. it is likely that the district may need take off the assistance of the Institutional finance.

Chitrakut Block of Karwi Tahsil is rich in forest and mineral resources. Here the following industries have developed :

i) **Forest Based :**

Wooden toy making, bamboo basket making.

ii) **Agro Based :**

Basket making from Arhar sticks, oil and dal processing units, hair oil making

iii) **Mineral based :**

Flat stone slabs used for roofing of the building,

stone grits for road making, stone meant for images.

The block offers good opportunity for setting of units of biri making as Tendu leaves used in biri making are found in the forest area of Mau and Karwi Tehsil. About 1.50 lakh bags of tendu are produced and exported by forest contractors out of district. Tanning and preservation of hides and skin can also be a good source of income to weaker section of people in the area.

Manikpur block also is one of the Blocks of karwi. It is a part of Patha area of the district. It is rocky and so means of irrigation are lacking, inspite of the forest wealth it is economically backward. If serious attention is given, the Tendu leaves which are produced here can be a good source of income for local people. A lot of people can be employed in the making of biri.

The local forest also produces chirounji, Kaththa and local tribals are employed in the collection of chirounji and manufacturing of kaththa. It is suggested that co-operatives of tribals should be organised. Such co-operatives be entrusted with collection of firewood. If a training and marketing of product of the area is started in a systematic way, articles like bamboo baskets and other bamboo articles like bamboo toys and some other fancy articles can be produced on a large scale.

Stone quarries also exist in this block. If exploited this can also be a source of income for the people of the area. A number of shoe making units on cottage basis have started giving employment to the people of Narini block

Agro and forest based industries like oil ghanies cum chakki, atta chakki cum Dal mill, biri making and other articles of bamboo can be taken up. Agricultural and non-agricultural Industries and the workers engaged in different activities according to Economic census 1991, are Shown in

Table No. 4.13

Economic Census - 1991

l.No. otal	Heads	Rural	Urban	Total
.	Number of Industries :			
	A) Agriculture	944	110	1054
	b) Non-Agriculture	14040	9611	23651
	c) Total	14984	9721	24705
.	Number of institution where are engaged on hired labour (Agriculture + Non-Agriculture)	1939	2706	4645
.	Number of private industries (Agriculture + Non-agriculre)	13045	7015	20060
.	General worker,s engaged in industries (hired and getting on salary) :			
	A) Male	21869	21176	43045
	B) Femal	3582	1556	5138
	C) Total	25451	22732	48183
5.	Workers engaged in general (Permanent Labour) :			
	A) Male	6015	10573	16588
	B) Female	753	680	1433
	C) Total	6768	11253	18021

Source : Census - 1991

table No. 4.13.

The Govt.. and other agencies can do a lot to improve the condition of the people living here. There are good opportunities of employment.

8) Occupational Distribution :

The population of 1991 reveals that a heavy concentration of population is in the rural area. The rural population derives its livelihood mainly from agriculture. The other sectors of the district economy are far less developed and cannot absorb the ideal labour force. It is necessary to pay attention towards the improvement of the general condition of the large number of people engaged in the primary sector in order to remove the economic backwardness.

There are 804037 labourers in Banda district out of which 386103 farmers are from rural area and 11454 are from urban areas. The main occupation of the inhabitants of Banda district is agriculture. In the Banda district agricultural rural labourers are 167333 and agricultural urban labourers are 9572. The labourers engaged in gardening, forest and animal husbandry are 2878 and urban labourers are 1357. The rural workers engaged in digging miners are 1843 and urban labourers are 88. Industrial rural domestic labourers are 8303 and industrial domestic urban labourers are 1856. Non-domestic Industrial rural labourers are 5155 and non-domestic urban labourers are 5765.

Looking at the details concerning the industries, it is clear that there has been much less improvement of industries in rural and urban area. We can say in other words that in comparison to other districts of U.P. Banda is very backward in the development of industries. In the construction work (construction of buildings etc.) the rural labourers engaged are 2321 and urban labourers are 2336. In transport rural labourers engaged are 2360 and 3771 are

urban. The number of rural labourers engaged in other works is 18224 and that of urban labourers is 15228. Table No. 4.14 will clarify this.

Table No. 4.14
Occupational Distribution

Years Blocks	Farmers	Agril. Labour	Animal husbandry gardening & Forest	Industry Digging of mines	Domestic	Non Domestic	Construction work	Trade & commerce	Transport	Other workers	Total of main workers	Marginal	Total
1971	226658	126376	1941	93	11893	3921	960	11259	2416	18333	-	185230	403850
1981	303790	130959	1591	417	11222	7180	5843	15855	4182	25769	66045	296148	572853
1991	397557	177205	4227	1131	10159	10920	4657	24574	6131	334452	670013	134024	804037
Jaspura	14592	7517	229	7	295	318	121	533	90	1004	24706	3478	28184
Tindwari	21299	13696	246	14	575	333	267	715	180	1883	39008	6552	45360
Barokhar Khurd	24901	14960	501	39	837	1054	293	826	281	2030	45722	7065	52787
Baberu	31153	14471	285	13	1007	488	212	872	176	1971	50648	14775	65423
Kamasin	28600	10645	130	8	657	254	59	567	85	1038	42043	13743	55786
Bisanda	31329	16420	105	3	665	297	89	478	82	1072	50540	13974	64514
Mahua	33708	19862	200	284	713	402	134	758	163	1663	57887	15488	73375
Naraini	51562	17800	195	173	757	524	207	1140	307	1753	74418	14065	88483
Pāhari	36607	14661	149	8	623	286	131	471	107	1323	54366	9469	63825
Karwi	36888	8387	197	149	670	438	284	849	347	1468	49777	8417	58194
Manikpur	29001	14214	416	178	752	250	340	554	297	1275	47357	8474	55031
Ram Nagar	17780	6004	68	18	286	119	48	332	43	680	25328	4870	30198

Table No. 4.14 Cont.....

Mau	28553	8996	149	149	466	392	136	902	202	1264	41209	9234	50443
Total of Rural	386103	167633	2870	1043	8303	5155	2321	8997	2360	18224	603009	129604	732613
Total of Urban	11454	9572	1357	88	1856	5765	2336	15577	3771	15228	67004	4420	71424
Total of District	397557	177205	4227	1131	10159	10920	4657	24574	6131	33452	670013	134024	804037

Source : Statistical Magazine, Distt. Banda

CHAPTER- V

Degree and Extent of Irrigation

i) Growth of Total Irrigated Area,

ii) Growth of net irrigated Area,

iii) Growth of Area Sown more than once

iv) Source wise Irrigated Area

v) Irrigation Intensity.

Chapter- V

Degree and Extent of Irrigation

Agriculture is the natural base for the over all advancement of the majority of the developing countries and the industries based on agriculture, a natural stepping stone towards industrial development on a large scale.

All this is possible only when irrigation system is quite sound. If there is proper arrangement of irrigation, the production increases a lot. As a result of this, facilities of road transportation, railways, postal system etc. are automatically increased. Government gets more land revenue and does more public welfare works. Many undeveloped and drought ridden areas have become prosperous and civilized.

The land of district Banda is rocky, hilly and covered with forest. The area more or less is un irrigated. In Uttar Pradesh this area is very hot. Due to being hot the crops are not good. In October the maximum temperature of the district remains 32.8°c and lowest is 20.4°c. In the month of May the maximum temperature remains 48.0°c and minimum temperature 32.06°c.

If we look behind the past history of irrigation, we come to know that regarding agriculture, efforts have been made since long. During the period of Nawabs attention was given to the system of irrigation.

In 1951 Ken Canal, in 1963-64 Ohan canal, in 1967-

68 Balja Canal, in 1968-69 Pump Canal, 1963-64 dam and other canals in 1972-73 tube wells etc. were constructed. All these mean that the facilities of irrigation were provided. In Jaspura block in between Ken and Chandrawati, Arjunah tank was constructed.

After Independence the first chief minister of Uttar Pradesh made a plan to make a survey of Banda District to know its real condition. Again during the period of chief Minister Mr. C.B. Gupta Rs. 2.5 crore were sanctioned for the construction of tanks and wells in Nirhar, Naraini and Karwi area. It was the misfortune of Mau tehsil from the beginning that no proper arrangement was made for irrigation.

Banda district is a backward district because there is no proper arrangement of irrigation. The means of irrigation are canals, tube-wells and tanks but they are insufficient. The main problem of the district is drought and the problem of drinking water. The position of drinking water is shown in table No. 5.1.

In summer season this problem becomes acute. In Patha area of the district the people of Kol tribe bring drinking water from an average distance of 10 Km. In Banda city the problem of drinking water is increasing day by day. There is much need of drinking water and water for irrigation of land. Due to non availability of water, the production stands to be of very low, level. The birds peacocks and other delicate animals are found less in number because they die due to lack of water and because of high temperatures. Here water resources are about 22 to 25 km. deep. Tanks and wells dry up. People are compelled to take out the water from the deepest.

Different means of irrigation are mostly canal tube-wells and tanks. The main source of irrigation is the canals

Table No. 5.1

Drinking Water Supply Position (1994-95)

Years/ Blocks	Villages under Mark-1 Hand Pump		Villages according to D.W.S. resources						Villages left under D.W.S. Scheme
	Vill-ages	Profitted Popula-tion	Wells	Hand Pump	Hand Pump Mark-2 India	Diggi	Others	Total	
1992-93	430	511596	298	475	430	-	-	1203	-
1993-94	430	1230563	296	475	430	-	-	1201	-
1994-95	430	123063	296	475	430	-	-	2101	-
Block : 1994-95									
Jaspura	29	70350	3	13	29	-	-	45	-
Tindwari	68	96713	8	4	68	-	-	80	-
Barokhar	28	39450	16	29	28	-	-	73	-
Baberu	54	95250	5	20	54	-	-	79	-
Kamasin	34	88350	21	20	34	-	-	75	-
Bisanda	8	108750	6	43	8	-	-	57	-
Mahua	5	143700	70	44	5	-	-	119	-
Naraini	-	18900	57	90	-	-	-	147	-
Pahari	12	111000	53	59	12	-	-	124	-

Table 5.1 contd. ... ...

Karwi	30	99300	24	76	30	-	-	130	-
Manikpur	68	77100	11	24	68	-	-	103	-
Ram Nagar	23	51750	17	31	23	-	-	71	-
Mau	71	59850	5	22	71	-	-	98	-
Total of Rural	430	1230563	296	475	430	-	-	1201	-
Total of Urban	-	-	-	-	-	-	-	-	-
Total of District	430	123563	296	475	430	-	-	1201	-

Source : District statistical magazine - 1995, D.S.E.O. Banda

because 68 percent of irrigated area is irrigated by canals. Though tube-wells too are the means of irrigation but like western districts, are not found in practice here. The current means of irrigation are shown in table No. 5.2 the use of canals is increasing year by year. This proves that irrigation is developing and the government agencies are taking active part in it. This will help to increase the agricultural production.

New means of irrigation are increasing day by day and the old ones are being replaced by new means which are also changing. This change is an indication of new era of functional activity of the process of development. The continuity is must, otherwise it will be a futile exercise.

Growth percentage of Net cropped area

(Since Independence- 5 years span)

Supposing the year 1950-51 as base year the percentage of coming years is shown in table No. 5.3

In 1955-56 the percentage of growth of net cropped area was 114.03 upto 1960-61 it increased and became 152.40 After 5 years in 1965-66 it decreased and came down to 123.31 but in 1970-71 it again increased and was 138.04. In 1975-76 it decreased again and was 133.57. In 1985-86 there was a nominal decrease. In 1990-91 it increased upto 143.88 and in 1995-96 there was nominal change. It was 142.50

Growth percentage of Net Irrigated Area :

Supposing the year 1950-51 as base year the growth percentage of net irrigated area of coming years upto 1995-96 has been shown in table number 5.4.

In 1955-56 the growth percentage of irrigated area was 121.75 percent. But up to 1960-61 it increased it increased a lot and reached upto 195.29 percent. In 1965-66 it decreased and was 135.64. In 1970-71 it increased a lot and reached upto 224.84. In 1975-76 it decreased but in

Table No. 5.2
Extent of Irrigation Resources 1994-95

Years/Blocks	Canals (length in Kms.)	Govt. Tube wells (Numbers)	Wells (Numbers)	Rahat (Numbers)	Pump set (Numbers)	Pump set for Boring	Private Tube-wells	Baghi in Hec.	Hauge (No.)	Gool (no.)	High drum (No.)
1	2	3	4	5	6	7	8	9	10	11	12
1992-93	1804	395	9453	3225	7051	6327	1638	45493	-	-	-
1993-95	1804	398	6920	3225	4894	10675	2204	-	-	-	-
1994-95	1804	398	3225	4894	10675	2204	-	-	-		
Block :											
Jaspura	8	85	123	12	119	275	21	-	-	-	-
Tindwari	116	142	178	15	136	437	363	-	-	-	-
Barokhar khurd	288	44	283	259	334	885	412	-	-	-	-
Baberu	229	61	490	70	359	991	98	-	-	-	
Kamasin	65	43	196	80	334	598	50	50	-	-	-
Bisanda	179	6	802	105	96	1153	87	-	-	-	-
Mahua	166	15	1240	113	218	1751	323	-	-	-	-
Naraini	142	2	405	1386	619	866	334	-	-	-	-
Pahari	166	-	417	-	489	-	818	137	-	-	-

Table 5.2 Contd. ... ...

Karwi	79	-	1101	990	632	1530	276	-	-	-	
Manikpur	166	-	733	41	617	384	54	-	-	-	-
Ram Nagar	111	-	194	31	313	325	24	-	-	-	-
Mau	89	-	758	123	628	662	25	-	-	-	-
Total of Rural	1804	398	6920	3225	4894	10675	2204	-	-	-	-
Total of Urban	-	-	-	-	-	-	-	-	-	-	-
Total of District	1804	398	6920	3225	4894	10675	2204	-	-	-	-

Source : Bulletin of Ag. Statistics - Directorate of Ag. U.P.

Table No. 5.3

Growth Percentage of Net cropped Area since Independence- 5 years Span

Years	Cropped Area	Percentage
1950-51	425423	100.00
1955-56	485124	114.03
1060-61	648374	152.40
1965-66	524697	123.31
1970-71	587234	138.04
1975-76	568232	133.57
1980-81	589968	138.68
1985-86	586734	137.92
1990-91	612083	143.88
1995-96	606240	142.50

Source : Basic Statistics- Directorate of Ag. U.P.

TABLE NO:-5.3 GROWTH PERCENTAGE OF NET CROPPED AREA

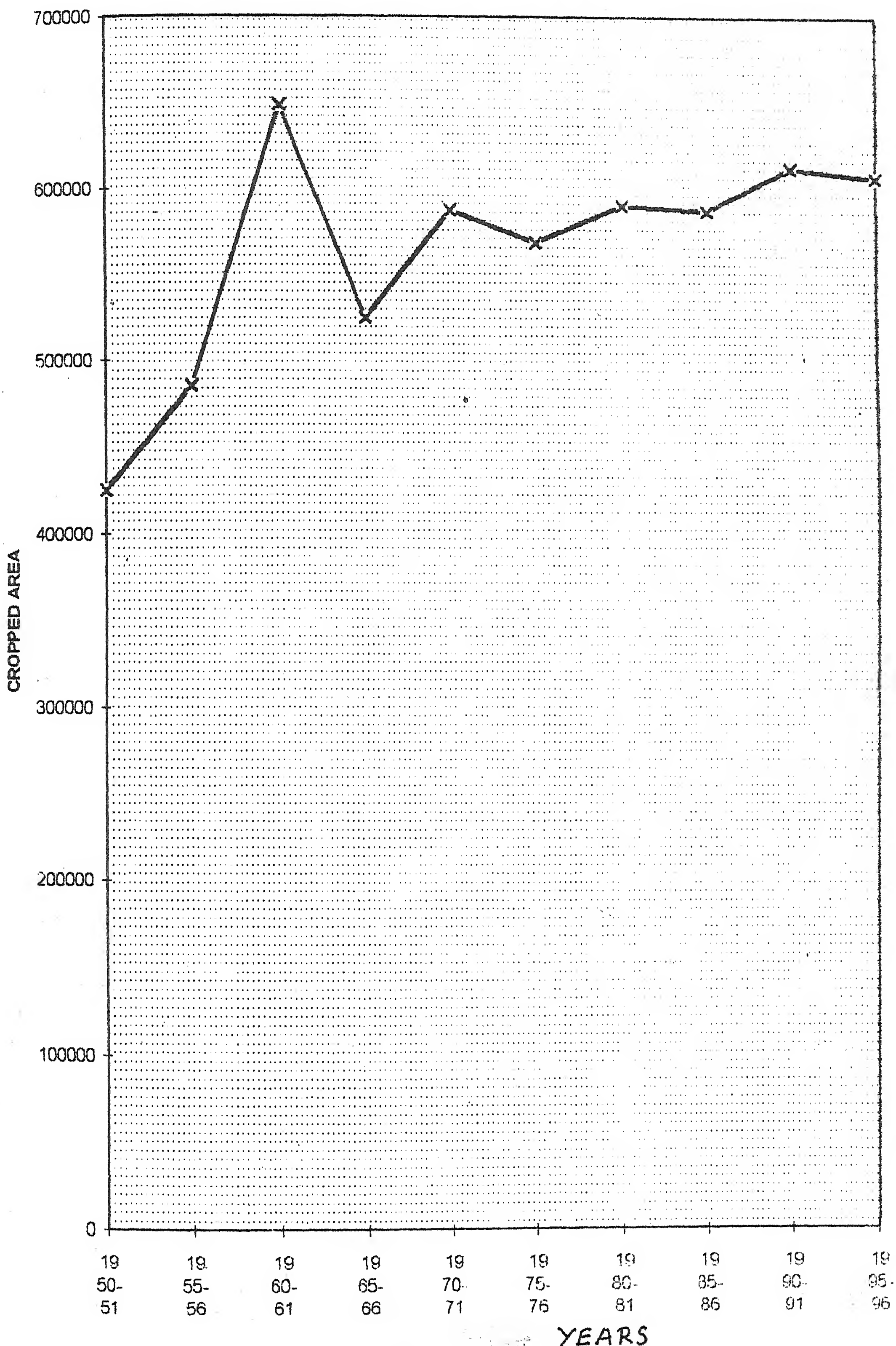


Table No. 5.4

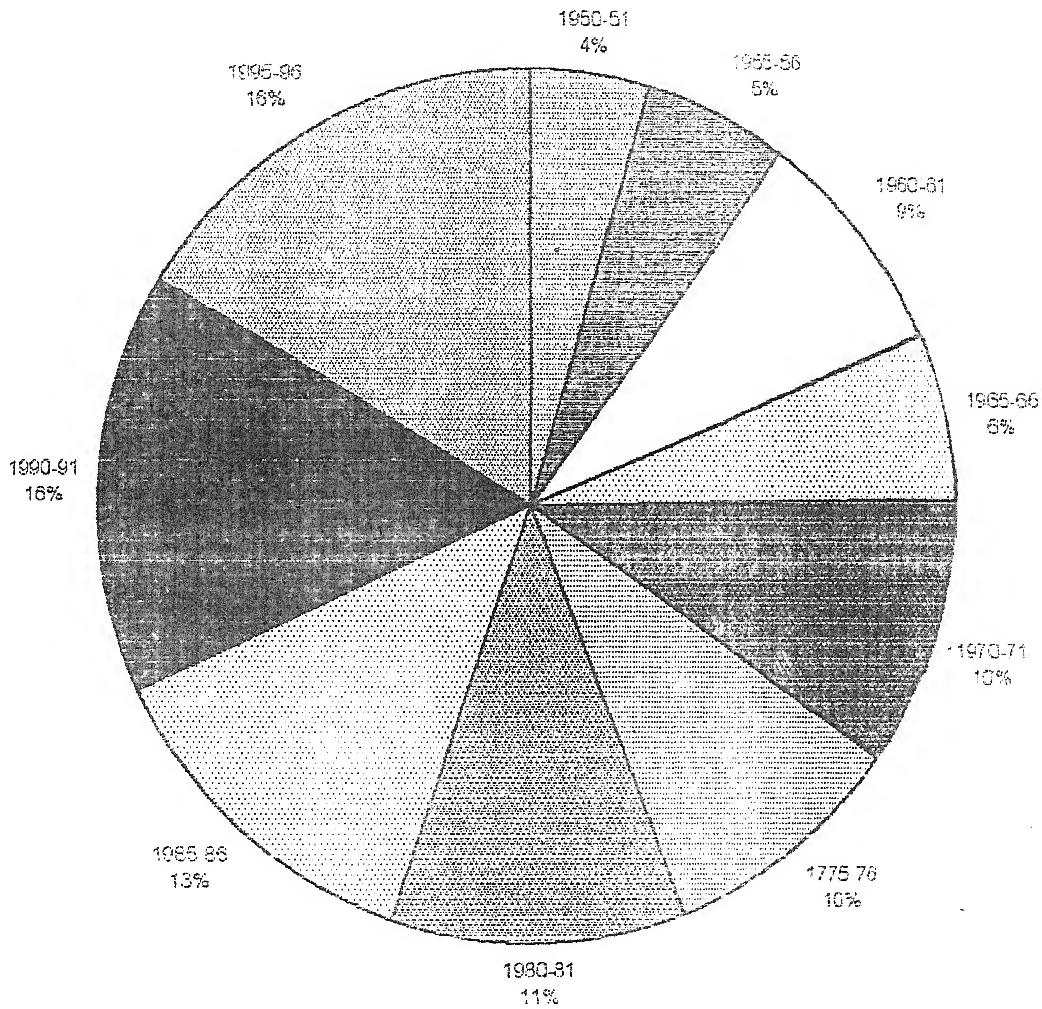
Growth percentage of Net Irrigated area

(Since Independence- 5 Years span)

Year's	Irrigated area	Percentage Growth
1950-51	41163	100.00
1955-56	50119	121.75
1960-61	80391	195.29
1965-66	55832	135.64
1970-71	92552	224.84
1975-76	88746	215.61
1980-81	102341	248.62
1985-86	116543	283.13
1990-91	143934	349.67
1995-96	152018	369.31

Source : Basic statistics Director of Ag.

TABLE NO:-5.4 GROWTH PERCENTAGE OF NET IRRIGATED AREA



1980-81 it increased and reached upto 248.62 but in 1990-91 increased a lot and reached upto 349.67 and in 1995-96 it increased again and was 369.31 percent.

Cropped and Irrigated area

(After Independence- 5 years span)

In percentage of cropped and irrigated area since 1950-51 upto 1995-96 has been shown in table No. 5.5

The percentage of cropped and irrigated area to net cropped area was 9.67 percent in 1950-51. It went on increasing upto 1960-61. After this it decreased upto 1965-66. In 1970-66. In 1970-71 it was 15.71 it was 15.76 and in 1975-76 it was 15.61 percentage. In 1980-81 it was 17.34 in 1985-86 it 19.68 in 1990-91 it was 23.52 and 1995-96 it was 25.08. Thus it went on increasing from 1970-71 upto 1995-96.

Growth percentage of total Irrigated Area :

Supposing the year 1980-81 as base year the growth percentage of total irrigated area upto the year 1994-95 has been shown in the table No. 5-6.

In the year 1981-82 the growth percentage of total irrigated area was 101.81 percent. In 1982-83 and 1983-84 it increased It was 112.26 and 117.09 respectively. In 1984-85 in decreased and was 112.80. In 1985-86 and 1986-87 it continued to increase. In 1987-88 it decreased a lot and became as low 111.80. In 1988-89 it increased again and was 126.71 percent. In the year 1989-90 it decreased so much that it was 103.63. From 1990-91 upto 1992-93 it continued to increase it was 138.38, 143.86, 153.15 respectively. In 1993-94 it decreased a little it was 150.84 and in 1994-95 it increased again. It was 156.53.

Growth Percentage of Net Irrigated Area :

Supposing the year 1980-81 as base year the growth percentage of net irrigated area has been shown from 1981-

Table No. 5.5

Cropped and Irrigated Area

Year	Cropped Area (in hec.)	Irrigated Area (in hec.)	Percentage of Net Irrigated Area to net area
1	2	3	4
1950-51	425423	41163	9.67
1955-56	485124	50119	10.33
1960-61	648374	80391	12.39
1965-66	524697	35832	10.64
1970-71	587234	92559	15.76
1975-76	568232	88746	15.61
1980-81	589968	102341	17.34
1985-86	586734	116543	19.86
1990-91	612083	143934	23.52
1995-96	606240	152018	25.08

Source : Basic statistics- Directorate of Ag. U.P.

TABLE NO. 5.5- CROPPED AND IRRIAGATED AREA

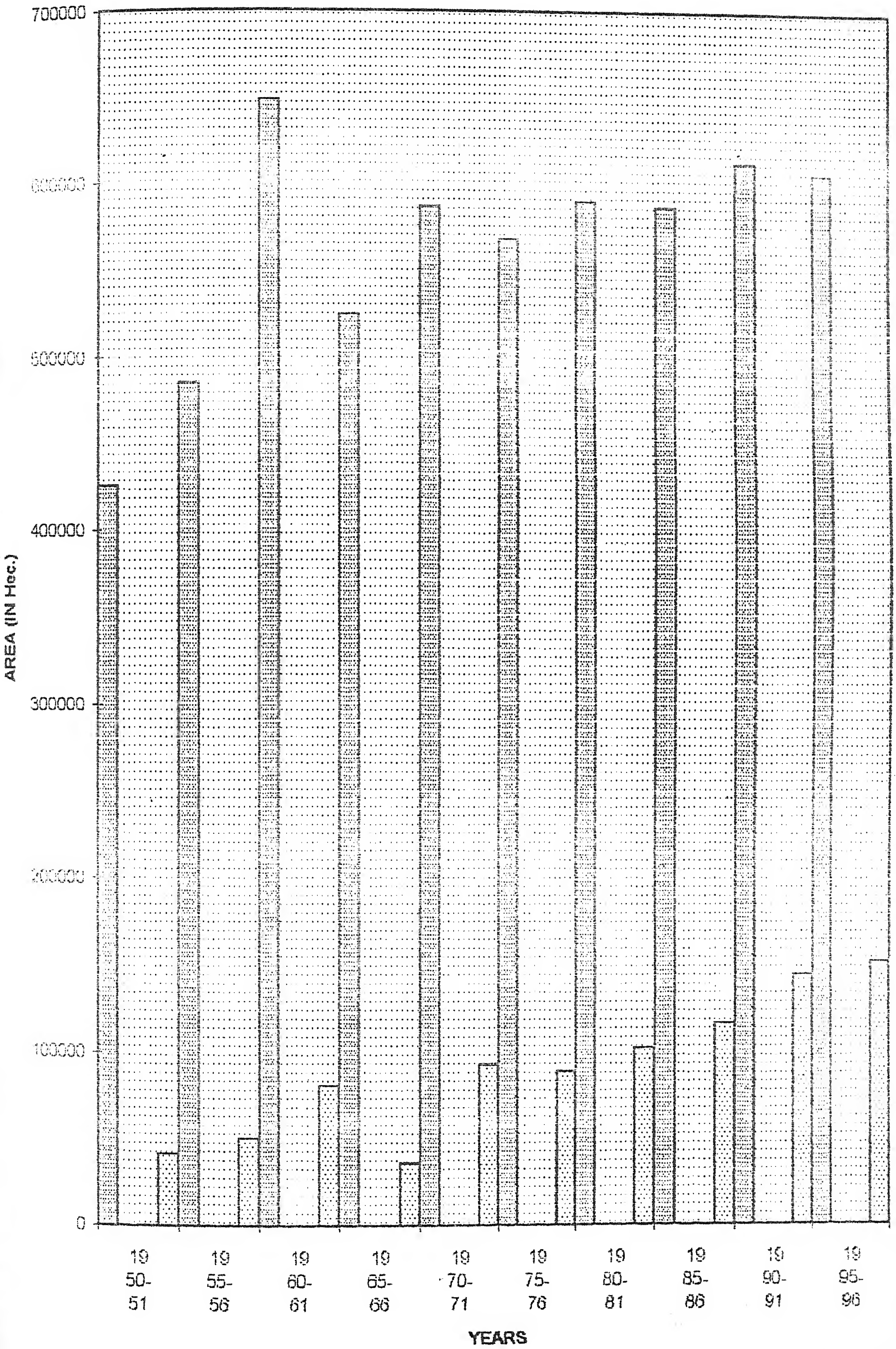


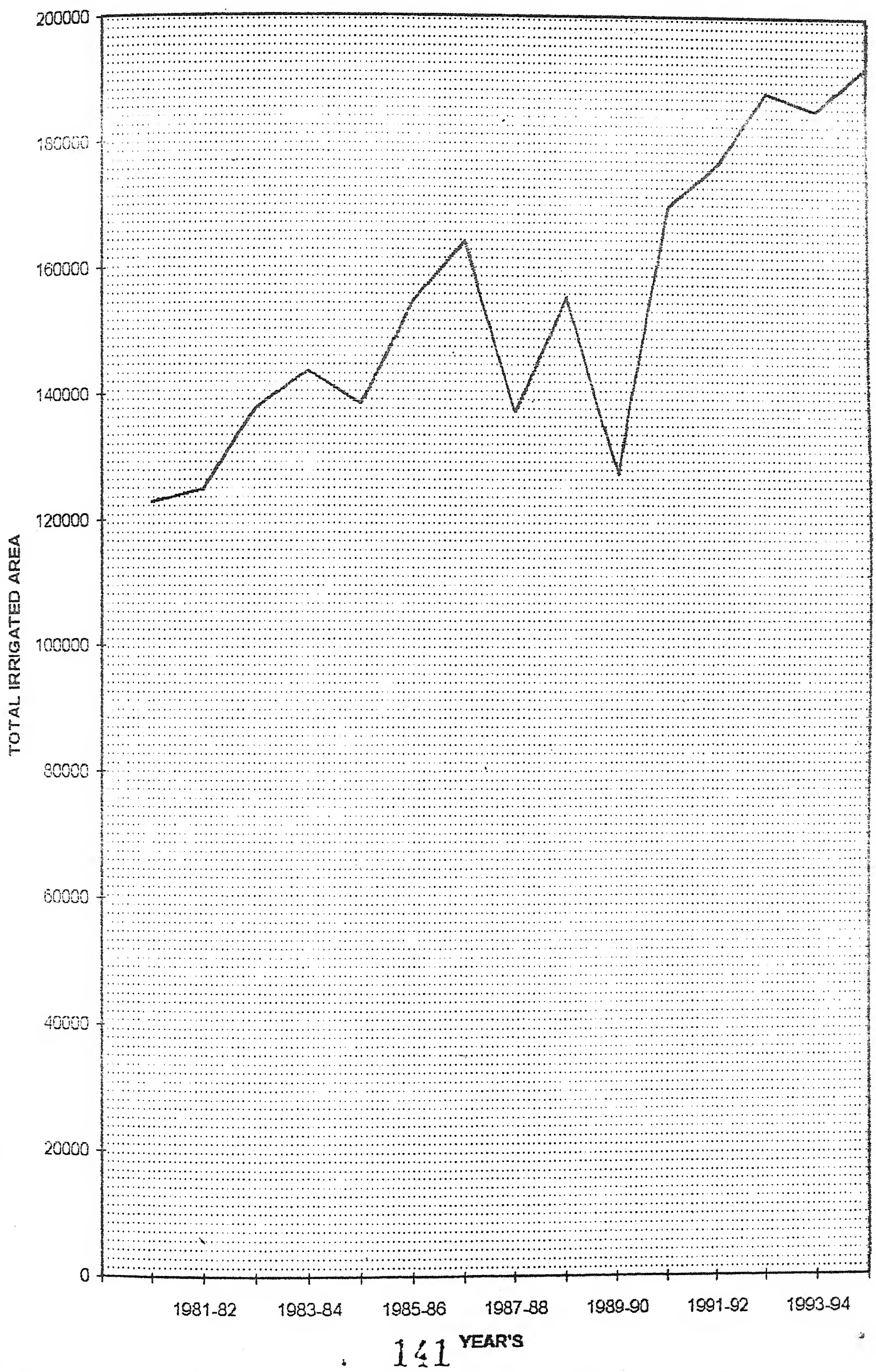
Table No. 5.6

Growth Percentage of Total Irrigated Area

Year	Total Irrigated area (In hec.)	Percentage growth
1	2	3
1980-81	122661	100.00
1981-82	124876	101.81
1982-83	137700	112.26
1983-84	143632	117.09
1984-85	138365	112.80
1985-86	154694	126.12
1986-87	164148	133.82
1987-88	137142	111.80
1988-89	155428	126.71
1989-90	127119	103.63
1990-91	169744	138.38
1991-92	176460	143.86
1992-93	187851	153.15
1993-94	185021	150.84
1994-95	192011	156.53

Source : Basic statistics- Directorate of Ag. U.P.

TABLE NO:-5.6 GROWTH PERCENTAGE OF TOTAL IRRIGATED AREA



82 to 1994-95 in table No. 5.7

The growth percentage of the net irrigated area was 96.14 in 1981-82. In 1982-83 it decreased and was 94.11. In 1983-84 it increased and was 113.29. In 1984-85 decreased and came down to 103.70 percent. In 1985-86 and in 1986-87 it increased and was 113.80 and 120.85 percent. In 1987-88 it increased a little and was 94.38 from 1988-89 to 1989-90 it continued to decrease. It was 90.10 and 82.09 respectively. In 1990-91 it continued to increase. It was 101.88 and 140.69. In 1992-93 it decreased a little and in 1993-94 and 1994-95 it continued to increase. It was 140.54 and 144.51 respectively.

The frequent changes are to be kept under control to avoid uncertainties involving particularly down trends in agricultural incomes.

Growth Percentage of Area sown more than once :

Supposing the year 1980-81 as base year the growth percentage of area sown more than once has been shown in table No. 5.8 from 1981-82 to 1994-95.

In 1981-82 the growth percentage of area sown more than once was 93.37 percent. In 1982-83 it increased and was 137.46. In 1983-84 and 1984-85 it continued to decrease it was 84.24 and 91.86. In 1986-87 it increased. It was 106.13 percent. In 1987-88 it decreased and was 59.97. In 1988-89 in increased a little (82.83%) and in 1989-90 it decreased. In 1990-91 it increased a little (91.96%) and in 1991-92 it decreased again (82.89%). In 1992-93 it increased a little (96.29%) and in 1993-94 it decreased 83.79 percent. In 1994-95 it increased again and it was 95.23 percent.

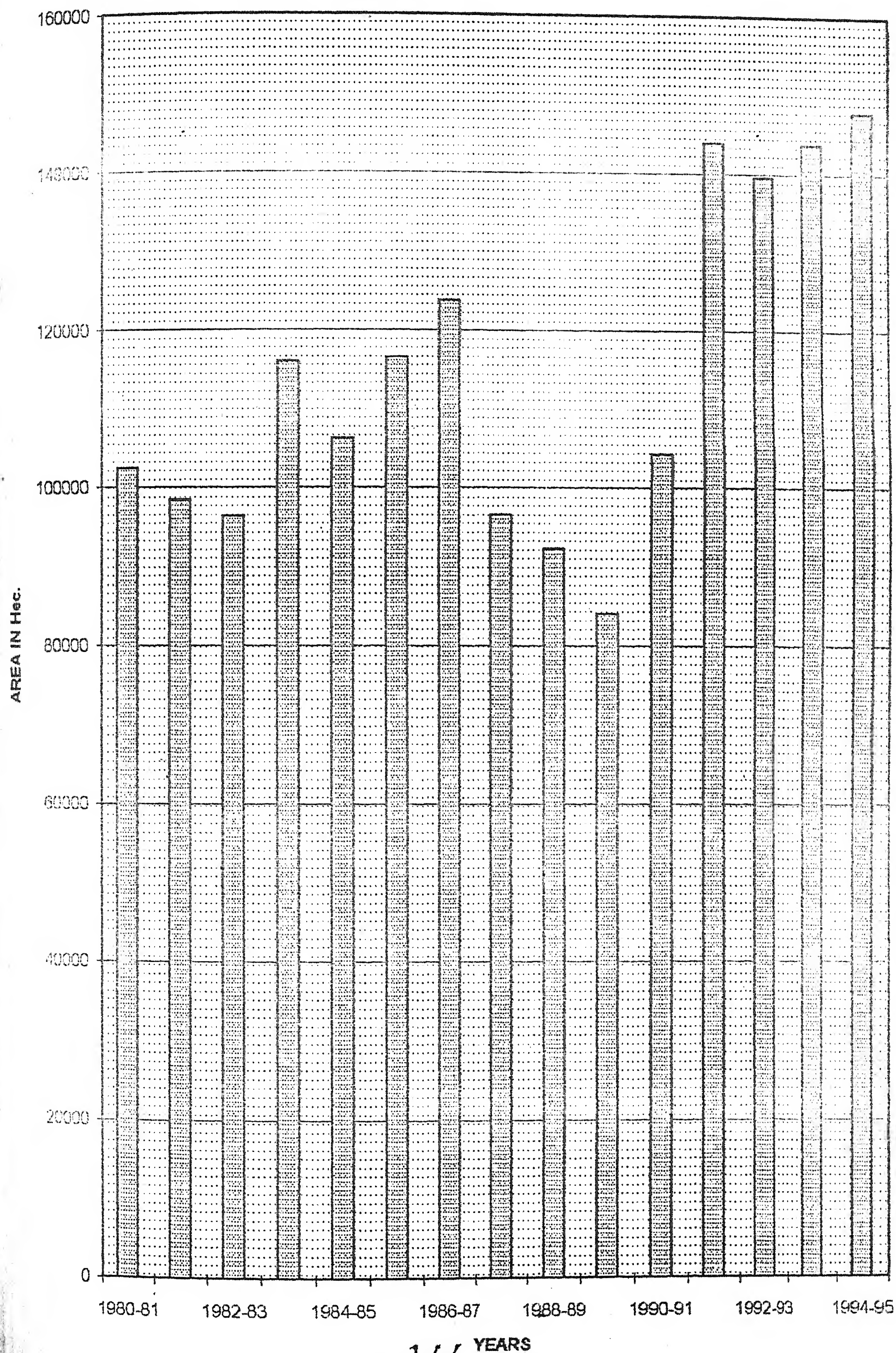
The fluctuations are very tight, attempts are to be followed to overcame them.

Growth Percentage of Net Irrigated Area

Year's	Net Irrigated area (in hec.)	Percentage Growth
1	2	3
1980-81	102341	100.00
1981-82	98393	96.14
1982-83	96301	94.11
1983-84	115952	113.29
1984-85	106129	103.70
1985-86	116468	113.80
1986-87	123674	120.85
1987-88	96588	94.38
1998-89	92213	90.10
1989-90	84015	82.09
1990-91	104269	101.88
1991-92	143984	140.69
1992-93	139675	136.48
1993-94	143826	140.54
1994-95	147894	144.51

Source : Basic statistics- Directorate of Ag. U.P.

TABLE NO. 5.7- GROWTH OF NET IRRIAGATED AREA

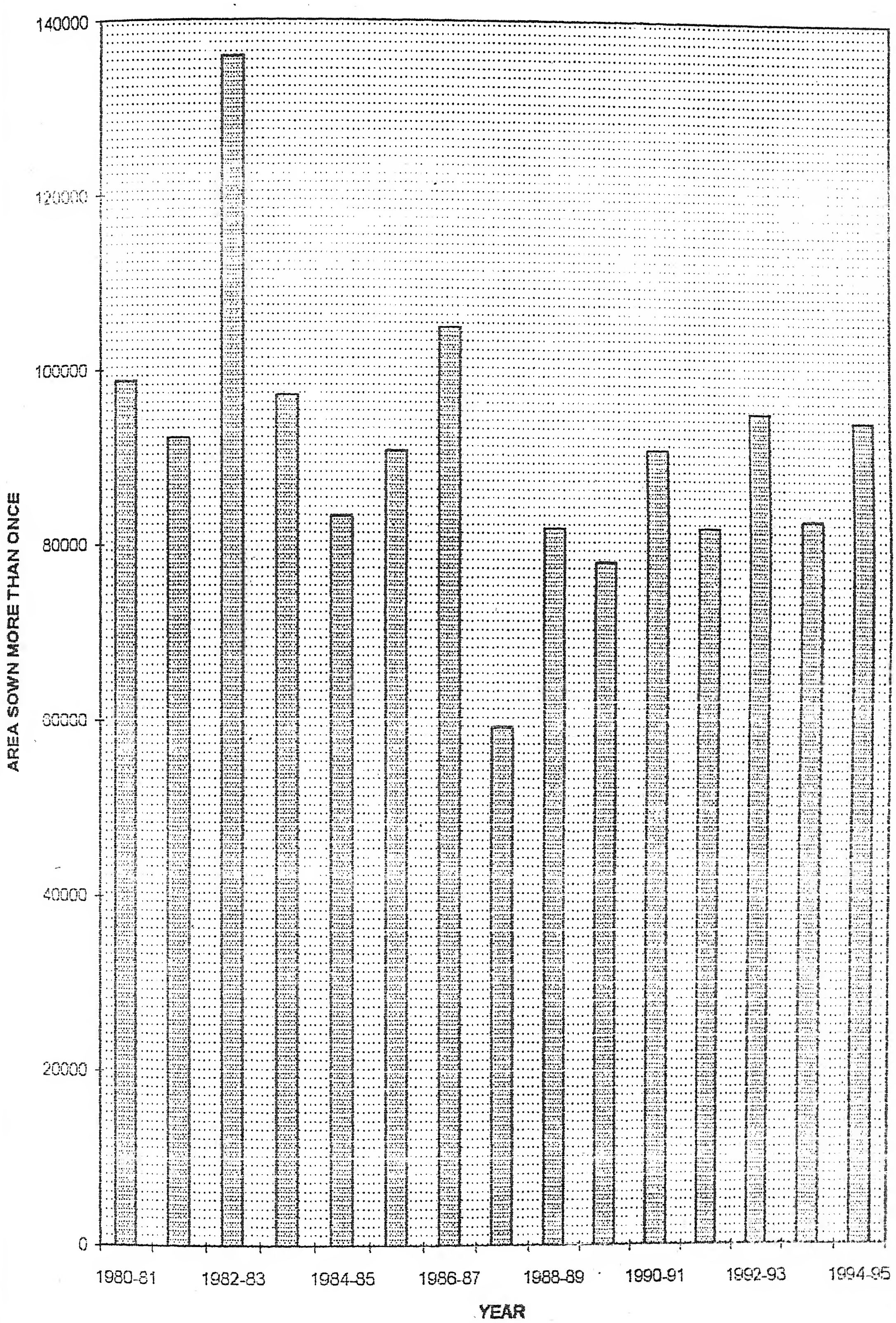


Growth percentage of Area Sown More Than once

Year	Area sown more than once (in hec.)	Percentage Growth
1	2	3
1980-81	98837	100.00
1981-82	92280	93.37
1982-83	355860	137.46
1983-84	97232	98.38
1984-85	83261	84.24
1985-86	90795	91.86
1986-87	104895	106.13
1987-88	59276	59.97
1988-89	81871	82.83
1989-90	78008	78.93
1990-91	90891	91.96
1991-92	81929	82.89
1992-93	95166	96.29
1993-94	82819	83.79
1994-95	94126	95.23

-Source : Basic statistics Directorate of Ag. U.P.

TABLE NO.5.8- GROWTH PERCENTAGE OF AREA SOWN MORE THAN ONCE



(V) Source wise Irrigated Area :

In Banda District the area irrigated by different means is shown in table No. 5.9. The table shows the condition from 1992-93 to 1994-95. In Banda district there are many means of irrigation. In the period from 1992-93 to 1994-95 the net irrigated area increased upto 147894 hectare from 139675 hectare. Some year the extension of irrigation depends on rainfall and some year when it rains sufficiently and in time, the need of more irrigation is felt. The utmost capacity of available means is not used. Contrary to this when it does not rain in time and sufficiently the irrigation is needed most.

From the beginning upto now canals have contributed utmost in irrigation, because in the net irrigated area their contribution is 67.39 percent. This proves that in the district canals are the most powerful means of irrigation. In the absence of this the system of irrigation will be shattered. The area irrigated by government tubewells is 8.31 percent and private is 7.56 percent. The development of tubewells is being done with the change of time. The area irrigated by tubewells has increased. The area irrigated by tubewells is 6.61 percent and irrigated by tanks is 1.71 percent and irrigated by other means is 8.42 percent.

The district still demands a greater amount of irrigation means because the limits of cultivation are still above.

Irrigation Intensity :

The percentage of Irrigation intensity in 1980-81 was 119.86. In 1981-82 and 1982-83 it continued to increase. It was 126.92 and 142.99. In 1983-84 it decreased. From the year 1984-85 upto the year 1988-89 it continued to increase. In 1989-90 it decreased and was 151.31. In 1990-91 it increased and was 162.79. In 1991-92 it decreased again. In 1992-93 it increased upto 134.49 percent. In

Table No. 5.9

Irrigated Area by Different Sources in Hect.

Years/Block	Canals	Tubewells		Wells	Tank	Others	Total
		Govt.	Pvt.				
1992-93	101048	20537	11513	10249	531	9387	15365
1993-94	96701	9135	11386	9004	1890	11559	139675
1994-95	96923	11951	10876	9500	2459	12117	143826

Source & Blockwise Distribution of Irrigated Area (1994-95)

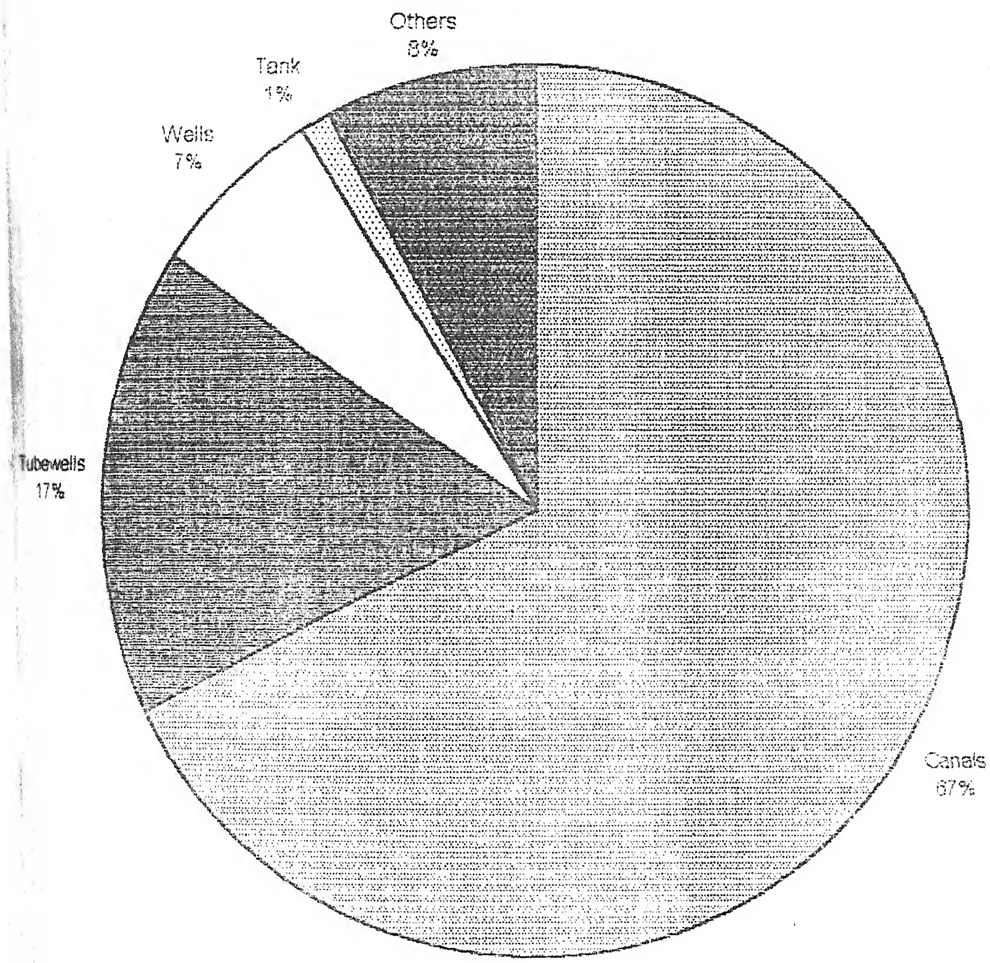
Jaspura	-	1713	444	102	3	74	2336
Tindwari	1671	3743	2829	375	2	300	8920
Barokhar Khurd	6225	1177	1665	188	131	798	10184
Baberu	8425	2140	168	-	103	215	11051
Kamasin	3894	1700	79	16	200	58	5939
Bisanda	21905	634	506	258	20	158	23481
Mahua	24203	358	396	321	24	202	25504
Naraini	13827	264	2124	2581	93	1284	20173
Pahari	5674	-	55	728	169	1309	7934
Karwi	4536	222	8	3233	923	2918	11840

Table 5.9 contd. ... ...

Manikpur	4839	-	1202	1189	586	1557	9373
Ram Nagar	1070	-	650	119	34	1287	3160
Mau	654	-	750	390	171	1966	3931
Total of Rural	96923	11951	10876	9500	2459	12117	143826
Total of Urban	-	-	-	-	-	-	-
Total of District	96923	11951	10876	9500	2459	12117	143826
%age	67.39%	8.31%	7.56%	6.61%	1.71%	8.42%	100

Source : Bulletin of Ag. Statictics, Directorate of Lucknow, U.P.

TABLE NO.5.9-> IRRIAGATED AREA OF DIFFERENT SOURCES IN Hec.



1993.94 it decreased and in 1994-95 it increased a little. It was 129.83. The irrigation intensity is shown in table No.- 5.10

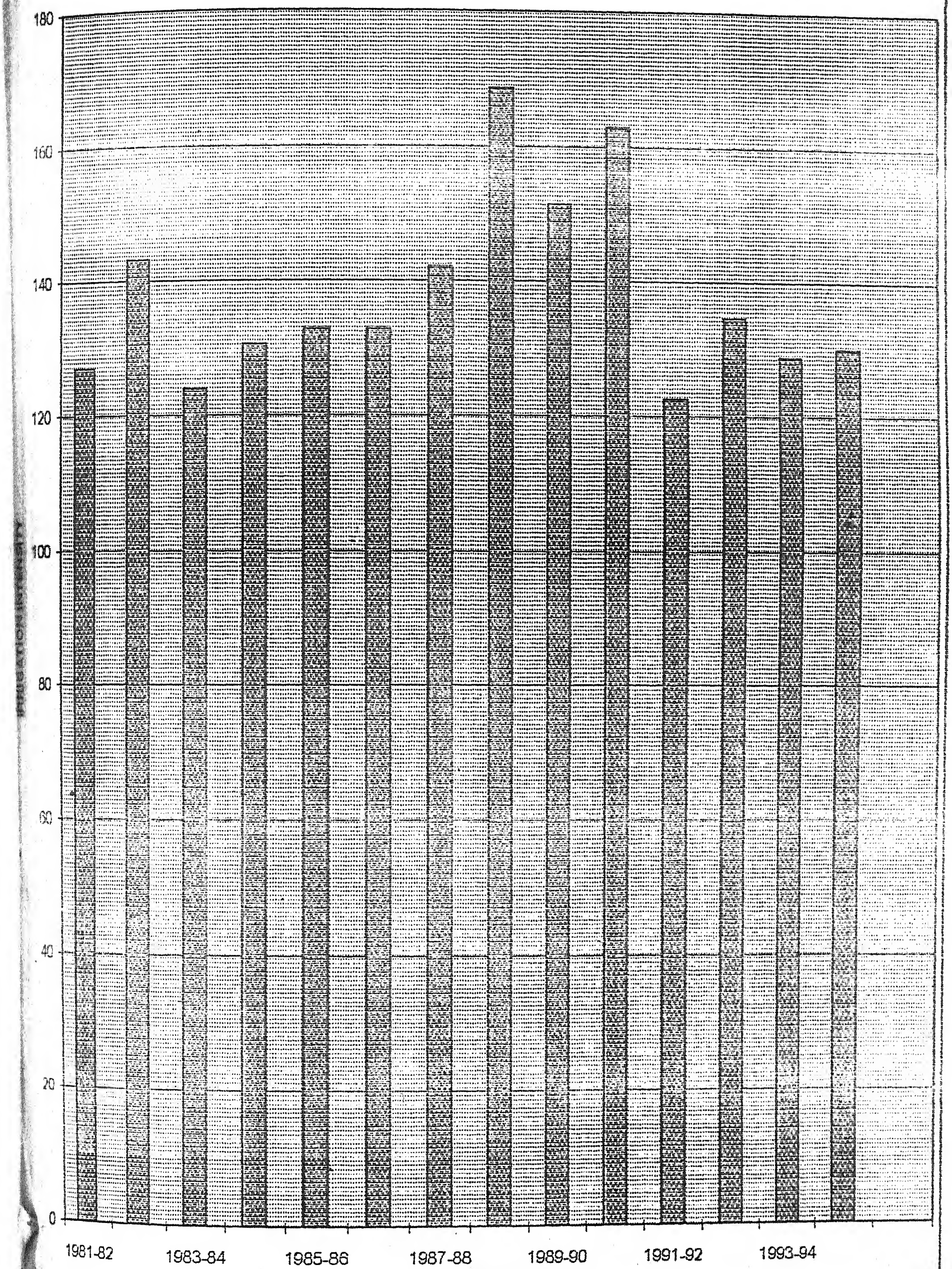
The ups and downs are certainly of precautions nature. The situation is static and seems to be overlooked. It is retrospective character, meaning thereby the traditional farming is still widely being practised. The modernisation of agriculture receives a low pitch. The careful attention seems to be a necessity to protect farming activities.

Table No. 5.10

Irrigation Intensity

Year	Irrigation Intensity
1980-81	119.86
1981-82	126.92
1982-83	142.99
1983-84	123.87
1984-85	130.37
1985-86	132.82
1986-87	132.72
1987-88	141.99
1988-89	168.55
1989-90	151.31
1990-91	162.79
1991-92	122.56
1992-93	134.49
1993-94	128.64
1994-95	129.83

TABLE No. 5.10–IRRIGATION INTENSITY



CHAPTER- VI

Eonomy of Selected Crops
(input-Output analysis)

i) Income/Cost of Wheat Cultivation

ii) Income/Cost of Gram Cultivation

iii) Income/Cost of Lentil Cultivation

iv) Income/Cost of Linseed Cultivation

Chapter- VI

Economy of Selected Crops
(Input Output Analysis)

I Economy of Wheat Cultivation

The basic data about cost of cultivation, income, profit, rate of return and the share in total farm income, from cultivation of wheat, in the case of individual farm units in the sample have been presented in detail in the appendix "A" at the end of this chapter. The summary tables derived from this basic data are presented in this chapter.

A) Cost of cultivation :

Cost of cultivating wheat, in the case of the different size of holdings, in regard to the various items of cost, works out to be as presented in the table 6.1. The figures have for the sake of clarity and easy grasp, been reduced to per acre basis. According to the different cost concepts, the overall results come to be as follows :

1) Total cost on variable and fixed items (cost C) Rs. 851.25.
2) Total cost (1 above) minus family labour (cost B) Rs. 676.63.
3) Cost under item 2 above minus rental value of owned land and interest on fixed capital including crop loans (cost A2) Rs. 367.62
4) Cost under item 3 above minus rent paid for lease in land (cost- A) Rs. 367.62.

The actual values of cost A2 and cost-A, are the same because the rent paid for lease in land is zero.

Cost of Cultivation of Wheat (Rs. per acre)

Size of Holdings (No. of cultivators)/ Cost Items	0-1 Acre		1-2 Acre		2-4 Acre		4-8 Acre		8 and above Acre		Total	
	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average
Operational Cost												
Human Labour												
Casual	72.22	5.16	170.00	42.50	195.00	65.00	67.00	33.50	139.17	69.98	643.39	25.73
		(0.57)		(4.67)		(9.46)		(4.67)		(9.77)		(3.02)
Attached	-	-	-	-	-	-	36.00	18.00	91.66	45.83	127.66	5.11
								(2.51)		(6.39)		(0.60)
Family	3364.45	240.32	605.00	151.25	240.00	80.00	136.00	68.00	20.00	10.00	4365.45	174.62
		(26.46)		(16.62)		(11.65)		(9.49)		(1.39)		(20.52)
TOTAL	3436.67	245.48	775.00	193.75	435.00	145.00	239.00	119.50	250.83	135.41	5136.50	205.46
		(27.03)		(21.29)		(21.11)		(16.67)		(17.55)		(24.14)
Buloock Labour												
Hired	489.22	34.94	56.00	14.00							545.20	21.81
		(3.85)		(1.54)								(2.56)
Owned	267.56	19.11	80.00	20.00	62.67	20.89	54.00	27.00	36.33	18.16	500.56	20.02
		(2.10)		(2.19)		(2.04)		(3.77)		(2.53)		(2.35)
TOTAL	756.78	54.05	136.00	34.00	62.67	20.89	54.00	27.00	36.33	18.16	1045.78	41.83
		(5.95)		(3.73)		(3.04)		(3.77)		(2.53)		(4.91)
Machine Labour												
Hired	363.01	25.93	118.00	29.50	38.34	12.78					519.35	20.77
		(2.86)		(3.24)		(1.86)						(2.44)
Owned	25.00	1.78					38.50	19.25	45.00	22.50	108.50	4.34
		(0.19)						(2.69)		(3.14)		(0.51)
TOTAL	388.01	27.71	118.00	29.50	38.34	12.78	38.50	9.80	45.00	22.50	627.85	25.11
		(3.05)		(3.24)		(1.86)		(1.37)		(3.14)		(2.95)

		(1.32)		(0.85)		(1.57)				(1.06)		(1.25)
Fertilisers & Manure												
Fertilizers	1281.77	91.55	426.00	106.50	204.33	68.11	221.40	110.70	209.33	104.66	2342.83	93.71
		(10.08)		(11.71)		(9.92)		(15.44)		(14.61)		(11.01)
Manure	1306.94	93.36	370.00	92.50	208.33	69.44	75.00	37.50	104.17	52.09	2064.44	82.58
		(10.28)		(10.16)		(10.11)		(5.23)		(7.27)		(9.70)
TOTAL	2588.71	184.91	796.00	119.00	412.66	137.55	296.40	148.20	313.50	156.75	4407.27	176.29
		(20.36)		(21.87)		(20.03)		(20.67)		(21.88)		(20.71)
Insecticides/Pesticides	-	-	5.00	1.25	28.33	9.45	45.00	22.50	15.00	7.50	93.33	3.74
	-	-	10.00	(0.14)		(1.38)		(3.14)		(1.04)		(0.44)
Water Expenses	358.24	25.59	108.16	2.50	-	-	-	-	-	-	10.00	0.05
		(2.82)		(0.28)								
Interest on Working				27.04	61.54	20.51	46.93	23.46	45.21	22.61	620.08	24.80
Capital				2.97		(2.98)		(3.27)		(3.15)		(2.91)
Total Operational Cost	358.24	545.68	1979.16	494.79	1070.87	356.96	739.43	369.71	721.20	360.60	12206.26	488.25
		(60.53)		(54.35)		(51.97)		(51.58)		(50.35)		(57.36)
Fixed Cost												
Rental Value of owned land	3727.98	266.28	1133.93	238.84	832.68	277.56	551.72	275.86	620.00	310.00	6866.31	274.65
		(29.32)		(31.15)		(40.43)		(38.49)		(43.27)		(32.26)
Land Revenue, cesses & Taxes	52.27	3. 78	16.07	4.02	11.07	3.69	10.78	5.39	9.67	4.84	100.56	4.02
		(0.41)		(0.44)		(0.54)		(0.75)		(0.67)		(0.47)
Implements & farm buildings	447.24	31.95	158.78	39.69	53.11	17.70	44.93	22.46	32.48	16.24	736.54	29.46
Depreciation		(3.52)		(4.36)		(2.57)		(3.13)		(2.27)		(3.46)
Interest	447.24	31.95	264.84	66.21	53.11	17.70	61.23	30.61	32.48	16.24	858.90	34.36
		(3.52)		(7.29)		2.57		(4.27)		(2.27)		(4.04)
Repair	343.48	24.53	87.16	21.79	39.65	13.22	25.47	12.74	16.97	8.43	512.73	20.51
		(2.70)		(2.39)		(1.92)		(1.78)		(1.17)		(2.41)

Total fixed cost	5018.91	358.49 (39.47)	1660.78	415.19 (45.63)	989.62	329.87 (48.03)	694.13	347.07 (48.42)	711.60	355.80 (49.65)	9075.04	363.00 (42.64)
Total cost C	12714.51	908.17 (100.00)	3639.94	909.98 (100.00)	2060.49	686.83 (100.00)	1433.56	716.78 (100.00)	1432.80	716.40 (100.00)	21281.30	851.25 (100.00)
Total cost B	9350.06	667.85	1636.17	758.73	1820.49	606.83	1297.56	648.78	1412.80	706.40	16915.85	676.63
Cost A2	5174.84	369.62	1636.17	409.04	934.70	311.57	684.61	342.31	760.32	380.16	9948.98	376.62
cast A1	5174.84	369.62	3034.94	409.04	934.70	311.57	684.61	342.31	760.32	380.16	9948.98	376.62

For the analysis relevant to the present study the first cost concept (cost c) is considered to be appropriate. Hence the detailed analysis and explanations presented in the following pages relate only to this.

The average cost per acre of cultivating wheat on the selected farms comes to Rs. 851.25 of which 57.36% (Rs. 488.25) is variable cost and 42.64% (Rs. 363.00) is fixed cost. The most costly item on the whole happens to be rental value of land farming 32.26% of the total cost and nearly 3/4th of the fixed cost. Besides, labour cost comprising of 24.14% happens to be the most important cost item. Within this item 20.52% happens to be family or domestic labour. The other items within the variable cost in the order of magnitude happen to be : fertilizer and manure 20.71% (fertilizer 11.01 and manure 9.70%), power 7.86% (bullock power 4.91%) and mechanical power 2.95%), seed 1.25%, insecticides 0.44% and irrigation .05%. Irrigation cost are insignificant because wheat is a rain fed Kharif corp. Irrigation happens to be in the case of early sowing in June, prior to the monsoon, or during prolonged dry spell. Wheat cultivation is labour intensive. Because of its commercial character (in the area of study) intensive use of fertilizer and manure is found to be commonly practised.

Looking to cost in relative to size of holding the distinctive features, as revealed by above evidence, are :

i) Size of the operational holding does not seem to have a bearing on total cost, as is proved by the following statistical results.

  a) Coefficient of correlation, r = 0.23
  b) Probable Error P.E. = 0.28
  c) Coefficient of Determination r2 = 0.059 or 5.3%
  d) Coefficient of Non-Determination K = 0.9471 or 94.7%

e) The regression equation x + .0079 y - 42204 = 0

The regression equations are y + 6.66 x- 815.572 = 0

where x is the size and y represents cost. The farmer is the regression equation of x/y while the latter is the regression equation of y/x,

coefficient of correlation is less than the six times the probable error and hence is insignificant, i.e., size does not affect, or is not found to be related to the cost. This is further established by the fact that the cost in relation to size is determined to the extent of 5.3% only, while it is being influenced by other factors to the extent of 94.7%. The same conclusion can be drawn by working out the proportions of x and y using the two regression equation, i.e., the regression coefficient of x upon y (bxy), - 0079 and the regression coefficient of y upon x (byx), - 6.66 together prove the validity of above statement.

ii) The relative proportions of variable and fixed costs on different size groups happen to be : 60.53% and 39.47% is the case of the smallest group i.e., 0-1 acre, 54.35% and 45.65% in the case of 1-2 acre-group, 51.97% and 48.03% in the case of 2-4 acre-group, 5158% and 48.42% in the case of 4-8 acre-group and 50.35% and 49.65% in the largest group i.e. 8 and above acre group. This indicates that the usual pattern is practically the same in the case of different size-groups. This, however includes two peculiarities:

a) in the case of 0-1 acre group the relative proportion of fixed cost is the lowest. It happens to be on account of the rental value per acre, being the lowest (29.32%) because of the greater crop intensity in these cases which brings down the rental value of cost on specific crop (wheat) and

b) the lowest proportion of variable cost and the highest proportion in the fixed cost in the case of the largest size- group i.e. 8 and above acre, which is primarily due to the minimum cost of labour (17.55%) and the maximum cost on rental value 43.27% in the latter.

iii) On the whole wheat is found to be a labour intensive crop, and secondly, the heavy use of fertilizer and manure is commonly followed by wheat growers. The combined situation exhibits the phenomena of heavy pressure of population on land and specialised commercial character of the specific crop. This is negative high degree of correlation (-0.75) between the size and the labour force and is not significant. This means that the labour units employed in farm operation however are not influenced by size as such though on larger holdings the labour cost decreases considerably owing to the very little use of family or domestic labour.

iv) The labour force (mostly domestic) is the constant factor, the cost influencing factors are fertilizer and manure and interest on fixed capital which have positive association with size i.e. as the size increases, they also increase.

v) Rental value (the top cost factor) is positively associated with the size and there is moderate degree of correlation (+ 0.66) between the two. This implies that the rental value per acre increases with the size but not significantly, and is mainly due to lesser crop intensity on larger size group. This further confirms the conclusion drawn in (ii) point while spelling out the peculiarity 'a'.

B) Income of wheat Cultivation

As per the different cost concepts the gross income per acre from wheat cultivation work-out to be, at 94-95 price level, as follows :

The average gross income per acre comes to be Rs. 1493.44 varrying from Rs. 1125.00 on the 4-8 acre farms to Rs. 1745.00 on 1-2 acre group, being Rs. 1550.08 on the smallest farms, Rs. 1285.00 on 1-2 acre group and Rs. 1275.00 on the largest size group 8 acres and above. These inter group differences are more magnified than those in the various elements of cost. This is in accord with the statistical results : as the coefficient of S.D. and variation for the income are 221.8 and 15.88 respectively, while the coefficient. of S.D. and variation for the cost are 99.7 and 12.66 respectively. They are caused partly by the differences in the price realized, depending upon the way the output was disposed off. The latter factor exercised greater influence. And this has determined the pattern of net income and profit on farm (or farmers) classes. This brings out an interesting feature that a greater decisive role in income and profit is played by forces and factors external to the farms than those internal to it. By its very logic this must add to farmers vulnerability, if they are not properly controlled. The fortunate situation is that they can be of course within limits .

The relationship between the size and income may be explained more accurately in terms of the following statistical measures:

i) r = 0.18

ii) P.E. = 0.29

iii) r2 = 0.0324 or 3.24%

iv) K = 0.9676 or 96.76%

Table No. 6.2

Average Gross Income per acre on different size of holdings, as per different cost concepts

Size Groups	Gross Income Average per per acre (Rs.)	Cost average per acre (Rs.)
0-1 acre	1550.08	908.17
1-2 acre	1745.00	909.98
2-4 acre	1285.00	686.83
4-6 acre	1125.00	716.78
8 and above	1275.00	716.40
Sample	1493.44	851.25

v) The regression equation of x/y is, $x + .0028\ y - 8.1088 = 0$

The regression equation of y/x is, $y + 11.61x - 14444.762=0$ where x is the size and y represents the income per acre. The low degree of negative correlation between size and income per acre which is insignificant, shows that the proportion of income decreases slightly with the size but is not being affected by it. It is more visible when we see the level of determination of income in relation to the size which is 3.24% only, i.e.. it is being mostly influenced by factors other than this (size) to the extent of 96.76%. The result is confirmed when we go through the regression equations and see that the regression coefficient of x/y is - .0028; and contrary to it, the regression coefficient of y/x is, - 11.61. This clearly indicates that the influence of size (x) upon income (y) is quite insignificant, or the size of the operational holding is not found to be related (or influencing) to the gross income per acre.

II) Economy of Gram Cultivation

The basic data regarding cost of cultivation, income and the share in total farm income from cultivation of Gram in the case of individual farm units in the sample, have been presented in detail in the appendix 'B' at the end of this chapter. The summary tables and the results derived from this basic data are presented in this chapter.

A) Cost of Gram cultivation :

Cost of cultivating gram in the case of the different size of operational holdings, in regard to the various items of cost, works out to be as presented in the table 6.3. The figures have, for the sake of clarity and easy grasp been reduced to per acre basis.

According to the different cost concepts the overall results come to be as follows :

Cost of Cultivation of Gram (Rs. per acre)

Size of Holdings (No. of cultivators)/ Cost Items	0-1 Acre Total	0-1 Acre Average	1-2 Acre Total	1-2 Acre Average	2-4 Acre Total	2-4 Acre Average	4-8 Acre Total	4-8 Acre Average	8 and above Acre Total	8 and above Acre Average	Total Total	Total Average
Operational Cost												
Human Labour												
Casual	265.10	33.14 (1.26)	582.81	83.26 (3.07)	476.73	79.46 (3.09)	441.53	147.18 (4.35)	93.52	93.52 (3.19)	1859.69	74.39 (2.71)
Attached	-	-	-	-	-	-	187.50	62.50 (1.85)	85.56	85.56 (2.92)	273.06	10.92 (0.42)
family	2497.70	312.21 (1.88)	1576.93	225.27 (8.29)	1040.46	173.41 (6.75)	382.08	127.36 (3.76)	184.23	184.23 (6.28)	5681.40	227.26 (8.29)
Total	2762.80	345.35 (13.15)	2159.74	308.53 (11.36)	1517.19	252.87 (9.84)	1011.11	337.04 (9.96)	363.31	363.31 (12.39)	7814.15	312.57 (11.40)
Bullock Labour :												
Hired	361.91	45.24 (1.72)	189.79	27.11 (1.00)	153.57	25.60 (1.00)	95.00	31.66 (0.94)	-	-	800.27	32.01 (1.17)
Owaned	114.67	14.33 (0.54)	215.62	30.81 (1.13)	174.26	29.04 (1.13)	8.43	2.81 (0.08)	57.55	57.55 (1.96)	570.53	22.82 (0.83)
Total	476.58	59.57 (2.27)	405.41	57.92 (2.13)	327.83	54.64 (2.13)	103.43	34.47 (1.02)	57.55	57.55 (1.96)	1370.80	54.83 (2.00)
Machine Labour												
Hired	473.60	59.20 (2.25)	800.66	114.38 (4.21)	472.00	78.67 (3.06)	250.83	83.61 (2.47)	350.00	350.00 (11.93)	2347.09	93.88 (3.43)
Owned	-	-	-	-	94.29	15.71 (0.61)	58.96	19.65 (0.58)	-	-	153.25	6.13 (0.22)
Total	473.60	59.20 (2.25)	800.66	114.38 (4.21)	566.29	94.38 (3.67)	309.79	103.26 (3.05)	350.00	350.00 (11.93)	2500.34	100.01 (3.65)

Seed	2064.24	883.08 (33.62)	5648.38	806.91 (29.71)	5185.40	864.23 (33.64)	3538.91	1179.64 (34.87)	767.39	767.39 (26.17)	22204.71	888.19 (32.41)
Fertilizers & Mannure												
Fertilizer	2411.24	301.40 (11.47)	2210.46	315.78 (11.63)	1785.61	297.60 (11.59)	1524.11	508.04 (15.02)	553.95	553.96 (18.89)	8485.38	339.41 (12.38)
Manure	1977.83	247.23 (9.41)	2402.49	343.21 (12.63)	1148.81	191.47 (7.45)	763.90	254.63 (7.52)	179.85	179.85 (6.13)	6472.88	258.92 (9.45)
Total	4389.07	548.63 (20.88)	4612.95	658.99 (24.26)	2934.42	489.07 (19.04)	2288.01	762.67 (22.54)	733.81	733.81 (25.02)	14958.26	598.33 (21.83)
Incecticides/Pesticides	125.81	15.73 (0.7)	105.32	15.05 (186. 27)	196.41	32.74 (1.28)	180.80	60.13 (1.78)	33.57	23.57 (1.14)	641.49	25.66 (0.94)
Water Expenses	1309.51	163.69 (6.23)	1303.90	186.27 (6.86)	953.00	158.83 (6.18)	627.89	209.29 (6.19)	122.31	122.31 (4.17)	4316.61	172.66 (6.30)
Interest on working Capital	1505.35	188.17 (7.16)	1347.59	192.51 (7.09)	1081.10	180.08 (7.02)	780.95	260.32 (7.69)	199.52	199.52 (6.80)	4914.61	196.58 (7.17)
Total Operational Cost	18107.35	2263.42 (86.16)	16383.95	2340.56 (86.19)	12761.10	2126.94 (82.80)	8840.47	2946.82 (87.10)	2627.46	2627.46 (89.59)	58720.87	2348.83 (85.70)
Fixed Cost												
Rental Value of Owned Land	1962.96	245.37 (9.34)	1731.96	247.42 (9.11)	2299.70	349.45 (13.63)	1076.08	358.69 (10.61)	248.47	248.47 (8.48)	7119.17	284.77 (10.39)
Land Revenue, cesses & Taxes	12.42	1.55 (0.06)	12.13	1.73 (0.06)	8.63	1.44 (0.06)	7.25	2.41 (0.07)	1.53	1.53 (0.05)	41.96	1.68 (0.06)
Implements & Farm Buildings												
Depreciation	322.94	40.37 (1.54)	323.58	46.22 (1.71)	216.34	36.06 (1.40)	80.54	26.85 (0.79)	16.79	16.79 (0.57)	960.19	34.41 (1.40)
Interest	373.21	40.65 (1.78)	552.28	50.33 (1.85)	216.34	36.06 (1.40)	80.54	26.85 (0.79)	16.79	16.79 (0.57)	1039.16	41.57 (1.52)
Repair	236.39.	29.55 (1.12)	205.92	29.42 (1.08)	109.82	18.30 (0.71)	46.44	21.48 (0.64)	21.58	21.58 (0.74)	638.15	25.52 (0.93)

Total Fixed Cost	2907.92	363.49 (13.84)	2625.87	375.12 (13.81)	2650.83	441.81 (17.20)	1308.85	436.28 (12.90)	305.16	305.16 (10.41)	9798.63	391.95 (14.30)
Total Cost C	21015.27	2626.91 (100.00)	19009.82	2715.68 (100.00)	15412.47	2568.75 (100.00)	10149.32	3383.10 (100.00)	2932.62	2932.62 (100.00)	68519.50	2740.78 (100.00)
Total Cost B	18517.57	2314.70	17432.89	2490.42	14372.01	2395.34	9767.24	3255.74	2748.39	2748.39	62838.10	2513.52
Cost A2	16181.40	2022.68	15348.65	2192.67	12055.97	2009.33	8610.62	2870.20	2483.13	2483.13	54676.57	2187.18
Cost A1	16181.40	2022.68	15348.65	2192.67	12055.97	2009.33	8610.62	2870.20	2483.13	2483.13	54676.57	2187.18

1) Cost C- Total cost on variable and fixed cost items Rs. 2740.78

2) Cost B- Cost c minus family labour Rs. 25130.52

3) Cost A2 Cost B minus rental value of owned land and interest on fixed capital including crop- loans Rs 2187.18

4) Cost A1- Cost A2 minus rent paid for leased in land Rs 2187.18 (cost A2 and Cost A1 were found to be the same, because rent paid for based in land is [illegible]).

The detailed analysis and explanation presented in the following pages relate to the first cost concept, i.e. Cost c as it is considered to be the most meaningful.

The average cost per hectare for cultivating gram on the sample is found to be Rs. 2740.78, of which 85.7% (Rs 2348.83) is the variable cost and 14.3% (Rs 391.95) is the fixed cost. The cost incurred on seed happens to be very high 32.41% of the total cost and more than 1/3 rd of the variable cost. The next important cost items are found to be fertilizer and manure, 21.83% (comprising of fertilizer 12.38% and manure 9.45%) Labour cost accounts for 11.40% (domestic labour alone farming 8.29%, and rental value of owned land for 10.39%. These are also found to be important items of cost. The other cost items within variable cost in the order of magnitude are : interest on working capital 7.17%, irrigation charges 6.30%, power 5.65% (bullock power 2.00%, mechanical power 3.65%) and insecticides/pesticides 0.94%. Insecticides/pesticides costs are insignificant because it is being used by few farmers. Very high use of fertilizer and manure and significant cost incurred on labour indicate that gram cultivation is highly specialised and commercialised.

Looking to the cost in relation to size of holding the distinctive features as revealed by this empirical evidence are as follows :

1) The relationship between the size and cost per acre (mainly for diagnostic purposes) can in more exact terms be expressed in terms of the following statistical measures:

a) r= + 0.64

b) P.E. = 0.18

c) r2 = 0.4096 or 41%

d) K = .5904 or 59%

e) The regression equation of x/y is, x + .007y + 15.7192 = 0 and the regression equation of x/y is, y- 54.17 x - 2618.086 = 0 where x is the size and y represents the cost per hectare.

Since the coefficient of correlation is less than six items the probable error, it is insignificant i.e., the size does not influence the cost. However, the degrees of determination and non-determination which are 41% and 59% respectively. It implies that its influence is of a moderate degree. The regression coefficients, bxy = -.007 and byx = 54.17 further indicate the bearing of x (size) upon y (cost), from this we conclude that the cost rises moderately or larger sizes.

2) The relative proportions of variable and fixed costs on different size of holdings are found to be as : 86.16% and 13.84% smallest farms i.e.. 0-1 acre groups; 86.19% and 13.81% on 1-2 acre group; 82.80% and 17.20% on 2-4 acre group; 87.10% and on 4-8 acre group and 89.59% and 10.41% largest farms, i.e.. 8 and above acre group. The pattern of relationship between the fixed and the variable costs seems practically the same in the case of different size group. This however, conceals some peculiarities; viz (a) in the case of 8 and above acre group, the relative proportion of fixed cost is the lowest. It is the outcome of greater crop intensity which lowers the rental value of owned land per acre. The relative proportion

of variable cost is the highest because of greater cost incurred on power, (b) in the case of 2-4 acre farms the relative proportion of fixed cost is the highest because of lower crop intensity with significant increases per acre. The rental value of land and the relative proportion of variable Cost are the lowest because of lesser cost involved on labour and (c) in the case of the smallest farms the relative proportion of labour cost is the highest.

3) Gram cultivation on the whole is found to be highly fertilizer and manure intensive and secondly, labour intensive. This is a characteristic feature of specialised commercial nature of this specific crop in the area of study.

4) There is a very low degree of positive correlation (+ .016) between the farm size and labour input which is insignificant. This indicates practically no relationship. However, the farm size and fertilizer and manure use are positively associated, but the relationship is not significant. This, means, the technology is neutral to scale. The former illustrates the labour intensity on small farms, while the latter indicates the better use of fertilizer and manure on the largest farms.

B) Income of Gram Cultivation :

As per different cost concepts, the gross income per acre from gram cultivation at 94-95 price level are found to be in table 6-4.

The average gross income per acre is found to be Rs. 7321.20 varying from Rs. 9404.49 on 4-8 acre group to Rs 6390.88 on the largest farms, being Rs. 7137.27 on 2-4 acre group, Rs. 6915.06 on 1-2 acre group and Rs. 6772.88 on the smallest farms. The inter group differences are more magnified in comparison to the use of the elements of cost. The

Table No. 6.4

Average Gross Income per acre on different size of Holdings, as per different cost concepts :

Size Group	Gross Income Average per acre	Cost Average per acre (Rs)	(Rs)
0-1 acre	6772.88	2626.91	
1-2 acre	6915.06	2715.68	
2-4 acre	7137.27	2568.75	
4-8 acre	9404.49	3383.10	
8 and above acre	6390.88	2932.62	
Sample	7321.20	2740.78	

coefficient of variable for the income and cost come to be 14.78 and 10.33 respectively. These differences in the average gross income occur partly because of the differences in the output per hectare and partly because of the varying price availability for their produce. The latter factor, which is an external one, is found to play the dominating role in determining the level of profit, or net income, on the farm classes.

To study the relationship between the size and gross income more exact terms the following statistical measures have been worked out.

To study the relationship between the size and gross incomeinmore exact terms the following statistical measures have been worked out :

i) $r = +\ 0.14$

ii) P.E. = 0.29

iii) r2 = 0.0196 or 2%

iv) K = 0.9804 or 98%

v) The regression equation of x/y is; $x - .00045y - .94922 = 0$ and the regression equation of y/x is; $y - 43.46\ x - 7041.468 = 0$

The above statistical measures show that the relationship between the farm size and gross income per hectare is not significant, i.e.. the farm size is not found to be related to the gross income. The latter is not determined by the former. It is being influenced by the factors other than the farm size to the extent of 98%. Besides the two regression coefficients show that the bearing of x (size) upon y (income) is almost negligible.

III) Economy of Lentil Cultivation :

The basic data about cost of cultivation, income, and the share in total farm income from cultivation of lentil, in the case of individual units in the sample have been presented in detail in the appendix 'C'

at the end of this chapter. The summary tables derived from this basic data are presented in this chapter.

A) Cost of Lentil Cultivation :

Cost of cultivating Lentil, in the case of the different size of holdings, in regard to the various items of cost, works out to be as presented in the table 6.5. The figures have, for the sake of clarity and easy grasp been reduced to per acre basis.

According to different cost concepts the over all results come to be as follows :

1) Cost- C

   Total cost on variable and fixed cost items Rs. 1916.48.

2) Cost- b

   Cost c minus family labour Rs. 1412.16

3) Cost A_2

   cost B minus rental value of land and interest on fixed capital including crop loans Rs. 1030.81.

4) Cost A_1

   Cost A_2 minus rent paid for based in land Rs. 1030.81. No case was reported for 'rent paid' for based in therefore cost A2 = cost A1.

For the analysis relevant to the present study the first cost concepts (cost c) is considered to be appropriate. Hence the detailed analysis and explanations in the following pages concern only to this.

The average total cost per acre of cultivating lentil for the sample as a whole comes to be Rs. 1916.48, of which 73.97% (Rs. 1417.65) is the variable cost and 26.03% (rs 498.83) is the fixed cost. The most costly item is found to be labour cost farming 33.69% of the total cost and nearly half of the variable cost. Within this item, domestic labour forms 26.31% of the total cost. The next important cost item happens to be fertilizer and manure forming 28.50% (fertilizer 20.80% and manure 7.70%) which is more than 1/3rd of the variable cost.

Cost of Cultivation of Lentil (Rs. per acre)

Size of Holdings (No. of cultivators)/ Cost Items	0-1 Acre Total	0-1 Acre Average	1-2 Acre Total	1-2 Acre Average	2-4 Acre Total	2-4 Acre Average	4-8 Acre Total	4-8 Acre Average	8 and above Acre Total	8 and above Acre Average	Total Total	Total Average
Operational Cost												
Human Labour												
Casual	567.14	70.89	1018.11	145.44	1213.74	202.29	504.69	168.23	231.70	231.70	3535.38	141.41
		(3.17)		(7.95		(11.23)		(10.61)		(14.12)		(7.38)
Attached	-	-	-	-	-	-	-	-	-	-	-	-
Family	6303.14	787.89	3248.19	464.03	2183.57	363.93	598.06	99.35	275.01	275.01	12607.97	504.32
		(35.19)		(25.38)		(20.21)		(12.57)		(16.76)		(26.31)
Total	6870.28	858.78	4266.30	609.47	3397.31	566.22	1102.06	367.58	506.71	506.71	16143.35	645.73
		(38.36)		(33.33)		(31.44)		(23.18)		(30.88)		(33.69)
Bullock Labour :												
Hired	243.81	30.48	60.75	8.68	25.74	4.29	8.33	2.78	-	-	338.63	13.55
		(1.36)		(0.48)		(0.24)		(0.18)				(0.71)
Owned	-	-	16.67	2.38	37.72	6.29	17.65	5.88	9.76	9.76	81.80	3.27
				(0.13)		(0.35)		(0.37)		(0.59)		(0.17)
Total	243.81	30.48	77.42	11.06	63.46	10.58	25.98	8.66	9.76	9.76	420.43	16.82
		(1.36)		(0.61)		(0.59)		(0.55)		(0.59)		(0.88)
Machine Labour												
Hired	329.61	41.20	176.66	25.24	73.41	12.23	-	-	-	-	579.68	23.19
		(1.84)		(1.38)		(0.68)						(1.21)
Owned	-	-	-	-	67.95	11.33	48.59	16.20	21.95	21.95	138.49	5.54
						(0.63)		(1.02)		(1.34)		(0.29)
Total	329.61	41.20	176.66	25.24	141.36	23.56	48.59	16.20	21.95	21.95	718.17	28.73
		(1.84)		(1.38)		(1.31)		(1.02)		(1.34)		(1.50)

Seed	372.00	46.50 (1.84)	291.91	41.70 (2.08)	267.33	44.55 (2.47)	120.04	40.01 (2.52)	41.46	41.46 (2.53)	1092.74	43.71 (2.28)
Fertilizers & Mannure												
Fertilizer	3533.00	441.63 (19.73)	2841.00	402.00 (21.98)	2316.96	386.16 (21.44)	947.14	315.71 (19.91)	354.27	354.27 (21.59)	9965.37	398.61 (20.80)
Manure	1113.52	139.19 (6.22)	859.15	122.74 (6.71)	801.72	133.62 (7.42)	770.39	256.80 (16.20)	146.34	146.34 (8.92)	3691.12	147.65 (7.70)
Total	4646.52	580.82 (25.95)	3673.15	524.74 (28.69)	3118.68	519.78 (128.86)	1717.53	572.51 (36.11)	500.61	500.61 (30.51)	13656.49	546.26 (28.50)
Incecticides/Pesticides	90.48	11.31 (0.50)	74.02	10.57 (0.58)	68.84	11.47 (0.64)	30.00	10.00 (0.63)	24.38	24.38 (1.48)	287.72	11.51 (0.60)
Water Expenses	348.75	43.49 (1.95)	351.07	50.15 (2.74)	303.00	50.50 (2.80)	150.00	50.00 (3.15)	50.00	50.00 (3.05)	1202.82	48.11 (2.52)
Interest on working Capital	664.18	83.02 (3.71)	525.07	72.01 (4.01)	413.89	68.98 (3.83)	242.79	80.93 (5.11)	73.64	73.64 (4.49)	1919.57	76.78 (4.00)
Total Operational Cost	13565.63	1695.70 (75.75)	9435.00	1347.94 (73.71)	7773.87	1095.64 (71.94)	3437.68	1145.89 (72.27)	1228.51	1228.51 (74.87)	35441.29	1417.68 (73.97)
Fixed Cost												
Rental Value of Owned Land	2378.30	297.29 (13.28)	2087.84	298.26 (16.31)	1919.69	331.95 (18.43)	897.75	299.25 (18.87)	299.11	299.11 (18.87)	7654.69	306.19 (15.98)
Land Revenue, cesses & Taxes	14.20	1.77 (0.08)	18.59	2.66 (0.14)	8.17	1.36 (0.08)	2.25	2.75 (0.05)	0.89	0.89 (0.05)	44.10	1.76 (0.09)
Implements & Farm Buildings												
Depreciation	561.56	70.19 (3.14)	256.86	36.69 (2.01)	189.73	31.62 (1.76)	84.77	28.26 (1.78)	21.46	21.46 (1.31)	1114.38	44.58 (2.33)
Interest	588.87	73.61 (3.29)	540.55	77.22 (4.22)	508.07	84.68 (4.70)	196.34	65.45 (4.13)	45.24	45.24 (2.76)	1879.07	75.16 (3.92)
Repair	799.33	99.92 (4.46)	461.80	65.97 (3.61)	333.90	55.65 (3.09)	137.73	45.91 (2.90)	45.73	45.73 (2.78)	1778.44	71.14 (3.71)

Total Fixed Cost	1312.26	542.78	3365.64	480.80	3031.56	505.26	1318.84	439.61	412.43	412.43	12470.73	498.83
		(24.25)		(26.29)		(28.06)		(27.73)		(25.13)		(26.03)
Total Cost C	17907.89	2238.58	12801.24	1828.74	10805.43	1800.90	4756.52	1585.50	1640.94	1640.94	47912.02	1916.48
		(100.00)		(100.00)		(100.00)		(100.00)		(100.00)		(100.00)
Total Cost B	11604.75	1450.59	9553.05	1364.71	8621.86	1436.97	4158.46	1386.15	1365.93	1365.93	35304.05	1412.16
Cost A2	8637.58	1079.69	6824.66	989.23	6122.10	1020.34	3064.37	1021.45	1031.58	1021.58	25770.29	1030.81
Cost A1	8637.58	1079.69	6824.66	989.23	6122.10	1020.34	3064.37	1021.45	1031.58	1021.58	25770.29	1030.81

Besides, the rental value of owned land comprising of 15.98% of the total cost and more than half of the fixed cost is also an important cost item. The other cost items in variable cost in the order of magnitude or found to be interest on working capital 4.00% water expenses 2.52%, power 2.38% (bullock power 0.88% and mechanical power 1.50%), seed 2.28% and insecticides/ pesticides 0.60%. The insecticides cost are insignificant. Thus, Lentil cultivation is highly labour intensive and secondly an intensive use of fertilizer and manure due to the commercial character of this crop, is being made by Lentil growers in the district.

Analysing the cost in relation to size of holding (mainly for diagnostic purpose) the peculiar features as revealed by the above evidence are :

i) The relationship between the size and cost can better be explained in terms of the following statistical measures:

a) r = - 0.69

b) P.E. = 0.16

c) r2 = 0.4761 or 47.6%

d) K = 0.5239 or 52.4%

e) The regression equation of x/y is; x = 186.1 - 01y, and the regression equation of y/x is; y = 2011.822- 45.91 x. Where x is the size and y represents the cost per acre.

There is moderate degree of negative correlation between the size of the operational unit and the cost. It is insignificant. The degree of determination (47.6%) and the two regression coefficients (bxy = - 0.01 and byx = - 45.91) together show the two are inversely related but the determining influence is not much or great.

ii) The relative proportions of variable and fixed costs on different size groups are found to be : 75.75% and 24.25% on the smallest farms, i.e.. 0-1 acre group, 73.71% and

26.29% on 1-2 acre group, 71.94% and 28.06% on 2-4 acre group, 72.27% and 27.73% on 4-8 acre group and 74.87% and 25.13% on the largest farms. This shows that the usual pattern is found to be broadly the same on different size of operational holdings. However it conceals some peculiarities viz (a) the relative proportion of the fixed cost is found to be the lowest whole the relative proportion of variable cost is found to be the highest. It happens to be so on account of higher cost on fertilizer and manure use which brings down the proportion of variable cost, (b) in the case of 2-4 acre group the highest proportion of fixed cost and the lowest proportion of variable cost happens to be on mainly due to the minimum cost on fertilizer and manure (28.86%) and intensive use of labour in the case of 0-1 acre group and use of fertilizer and manure in huge quantity on 4-8 acre farms found to be commonly practised.

iii) Lentil crop in this district is highly labour and fertilizer intensive. It is grown by a special class of growers. This illustrates the phenomenon of heavy population pressure on land (which is another expression of land scarcity or small scale farming) and the commercialised and specialised form under small- scale farming.

iv) The labour cost on larger size decreases gradually as the coefficient of correlation between the two is- 0.5 which is insignificant. This is an indication of better labour intensity on smaller farmers.

v) The size and the use of fertilizer and manure resource are positively associated. But the relationship is not significant. This indicates the better use of fertilizer and manure resource on larger farms (an indication of self effort), but much less than the optimum requirement (an indication of resource scarcity on their part. These farmers

are landless and sweepers by caste; follow casual cultivation on annual allotments. Lentil cultivation is the only source of their livelihood.

B) Income of Lentil Cultivation :

As per different cost concepts the gross income per acre from Lentil cultivation at 94-95 price level have been worked out in the table 6.6.

The average gross income per acre comes to Rs. 6097.04 for the sample as a whole. It varies from Rs. 7964.05 on the smallest farms to Rs. 3707.32 on the largest farms, and is Rs. 6015.92 on 1-2 acre group, Rs 5264.61 on 2-4 acre group and Rs. 3769.05 on 4-8 acre group.

The inter group differences are more wide than the elements of cost, as indicated by our statistical results, viz; the coefficients of variability for the income and cost are 29.06 and 12.58 respectively. This arises mainly from the difference in output per acre and the realisation of different prices, depending on the type (variety) and size of produce. The latter factor exercises greater role, but it too is connected with the quantity and the type of produce. Thus the decisive role in determining the profit or net income on the forms is being played by internal factors specially on the manner how successfully the farm activities (operations) are done.

To study the relationship between farm size and the gross income per acre, the following statistical measures were worked out :

i) $r = -0.8$

ii) P.E. = 0.11

iii) $r2 = 0.64$ or 64%

iv) $K = 0.36$ or 36%

v) The regression equation of x/y is; $x = -.002y + 14.8884$, the regression equation of y/x is; $y = -367.44 + 6887.448$ where x is the size and y represents gross income per acre. Since the coefficient of correlation is greater than six times

Table No. 6.6

Average gross income per acre on different size of Holding, as per different cost concepts

Size group	Gross Income average per acre (Rs.)	Cost average per acre (Rs.)
0-1 acre	7964.05	2238.48
1-2 acre	6015.92	1828.74
2-4 acre	5264.61	1800.90
4-8 acre	3769.05	1585.50
8 anD above	3707.32	1640.94
Sample	6097.04	1916.48

the probable error, it is significant, i.e.. the farm size has bearing upon the gross income and the latter decreases frequently on larger sizes. It is being influenced by the farm size to the extent on 64% while by the chance factors of the extent of 36%. Also the dependence of y (income) upon the x (size) is indicated by regression coefficient of y/x, i.e.. by x which is- 367.44 in comparison to bxy (-.002) leading to the same conclusion.

IV) Economy of Linseed cultivation :

The basic data about cost of cultivation income and the share in total farm income from cultivation of Linseed in the case of individual farm units in the sample have been presented in detail in the appendix at the end of this chapter. The summary tables derived from the basic date are presented in the chapter.

A) Cost of Linseed Cultivation :

Cost of cultivating Linseed in the case of different size of holdings in regard to the various items of cost, works out to be as prescribed in the table 6.7. The figures have for the sake of clarity and easy grasp been reduced to per acre basis.

According to the different cost concepts the overall results came to be as follows :

i) Total cost on variable and fixed cost item (cost) Rs. 2559.84

ii) Total cost 1 above minus family labour (cost B) Rs 1974.46

iii) Cost under item 2 above minus rental value of owned land and interest on fixed capital including crop loans (cost A_2) Rs. 1623.66.

iv) Cost under item 3 above minus rent paid for leased in land (cost A_1) Rs.1623.66.

The cost concept c being relevant to the present study is considered to be appropriate. Hence the detailed analysis and explanations presented in the following pages relate only to this.

The average cost per acre of cultivating Linseed on selected farms comes to be Rs. 2559.84 of which 82.03 (Rs. 2099.98) is variable cost

Cost of Cultivation of Linseed (Rs. per acre)

Size of Holdings (No. of cultivators)/	0-1 Acre		1-2 Acre		2-4 Acre		4-8 Acre		8 and above Acre		Total	
Cost Items	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average
Operational Cost												
Human Labour												
Casual	2545.38	254.54	1281.53	183.08	787.12	196.78	607.06	202.35	260.00	260.00	5481.09	219.25
		(8.83)		(7.79)		(8.12)		(9.38)		(10.16)		(8.56)
Attached	-	-	-	-	-	-	-	-	-	-	-	-
Family	7459.84	745.98	3573.53	510.50	1981.12	495.28	1140.09	380.03	480.00	480.00	14634.58	585.38
		(25.88)		(21.74)		(20.43)		(17.61)		(18.77)		(22.87)
Total	10,005.22	1000.52	4855.06	693.58	2768.24	692.06	1747.15	582.38	740.00	740.00	20115.67	804.63
		(34.71)		(29.53)		(28.55)		(26.99)		(28.93)		(31.43
Bullock Labour :												
Hired	1190.18	119.02	328.11	46.87	129.54	32.38	-	-	-	-	1647.83	65.92
		(4.13)		(1.99)		(1.34)		-		-		(2.58)
Owned	188.23	18.82	283.67	40.53	306.35	76.59	249.57	83.19	120.00	120.00	1147.82	45.91
		(0.66)		(1.72)		(3.16)		(3.86)		(4.69)		(1.79)
Total	1378.41	137.84	611.78	87.40	433.89	108.97	249.57	83.19	120.00	120.00	2795.65	111.83
		(4.79)		(3.71)		(4.50)		(3.86)		(4.69)		(4.37
Machine Labour												
Hired	1293.37	129.34	688.85	98.41	331.05	82.76	-	-	-	-	2313.27	92.53
		(4.49)		(4.19)		(3.41)		-		-		(3.62)
Owned	-	-	88.31	12.61	97.78	24.45	308.48	102.83	140.00	140.00	634.57	25.38
		-		(0.54)		(1.01)		(4.77)		(5.49)		(0.99)
Total	1293.37	129.34	777.16	111.02	428.83	107.21	308.48	102.83	140.00	140.00	2947.84	117.91
		(4.42)		(4.73)		(4.42)		(4.77)		(5.49)		(4.61)

Seed	242.06	24.21	181.52	25.93	99.71	24.93	72.65	24.22	24.00	24.00	619.94	28.80
		(0.84)		(1.10)		(1.03)		(1.12)		(0.93)		(0.97)
Fertilizers & Mannure												
Fertilizer	5343.26	534.32	2766.44	395.21	2054.77	513.68	1188.86	396.28	572.00	572.00	11925.26	477.01
		(18.54)		(16.83)		(21.19)		(18.36)		(22.36)		(18.66)
Manure	2892.08	289.21	1814.91	259.27	1013.01	253.25	742.53	247.51	240.00	240.00	6702.53	268.10
		(10.03)		(11.04)		(10.45)		(11.48)		(9.38)		(10.47)
Total	8235.34	823.53	4581.35	654.48	3067.71	766.93	1931.39	643.79	812.00	812.00	18627.79	245.71
		(28.57)		(27.87)		(31.64)		(29.84)		(31.74)		(29.13)
Insecticides/pesticibes	851.80	85.18	627.00	89.75	357.06	89.26	268.23	89.41	84.00	84.00	2188.09	87.52
		(2.95)		(3.81)		(3.68)		(4.15)		(3.28)		(3.42)
Water Expenses	979.87	97.99	686.19	98.03	392.02	98.01	201.69	87.23	100.00	100.00	2419.77	96.79
		(3.39)		(4.18)		(4.04)		(4.04)		(3.91)		(3.74)
Interest on working	1210.82	121.08	700.70	100.10	458.17	114.54	295.40	98.47	119.80	119.60	2784.69	111.39
Capital		(4.20)		(4.26)		(4.72)		(4.56)		(4.68)		(4.35)
Total Operational Cost	24196.89	2419.69	13020.76	1860.11	8007.63	2001.91	5134.56	1711.52	2139.60	2139.60	52499.44	2099.98
		(83.94)		(79.19)		(82.58)		(79.33)		(83.64)		(82.03)
Fixed Cost												
Rental Value of Owned Land	2832.93	283.29	2198.09	314.01	1111.47	277.87	987.20	329.07	245.04	245.04	7374.73	294.99
		(9.83)		(13.37)		(11.46)		(15.26)		(9.58)		(11.52)
Land Revenue, cesses & Taxes	58.68	5.87	51.82	7.40	13.54	3.38	12.79	4.26	4.96	4.96	141.79	5.67
		(0.20)		(0.31)		(0.14)		(0.19)		(0.19)		(0.22)
Implements & Farm Buildings												
Depreciation	526.71	52.67	360.09	51.44	198.17	39.54	82.84	27.61	28.92	28.92	1156.73	46.27
		(1.83)		(2.19)		(1.63)		(1.28)		(1.13)		(1.81)
Interest	526.71	52.67	402.99	57.57	176.58	44.15	101.21	23.74	37.76	37.76	1245.25	49.81
		(1.83)		(2.45)		(1.82)		(1.56)		(1.48)		(1.94)
Repair	684.16	68.42	408.07	58.30	230.25	57.56	153.83	51.28	101.84	101.84	1578.15	63.12
		(2.37)		(2.49)		(2.37)		(2.38)		(3.98)		(2.48)

Total Fixed Cost	4629.19	462.92 (16.06)	3421.06	488.72 (20.81)	1690.01	422.50 (17.42)	1337.87	445.96 (20.67)	418.52	418.52 (16.36)	11496.65	459.86 (17.97)
Total Cost C	28826.08	2882.61 (100.00)	16441.82	2348.83 (100.00)	9697.64	2424.41 (100.00)	6472.43	2157.48 (100.00)	2558.12	2558.12 (100.00)	63996.09	2559.84 (100.00)
Total Cost B	21366.24	2136.62	12868.29	1838.33	7716.52	1929.13	5332.34	1777.45	2078.12	2078.12	49361.51	1974.46
Cost A2	18006.60	1800.66	10267.73	1466.75	6446.88	1607.11	4243.93	1414.64	1795.32	1795.32	40741.53	1629.66
Cost A1	18006.60	1800.66	10267.73	1466.75	6446.88	1607.11	4243.93	1414.64	1795.32	1795.32	40741.53	1629.66

and 17.97 (Rs. 459.86) is fixed cost. The most costly item was found to be human labour forming 31.43% of the total cost and more than 2/3rd of the variable cost. And within this cost item family labour forms 22.87% of the total cost. Next to labour cost, the cost on fertilizer and manure being 29.13% of the total cost also happens to be important. Within the cost item fertilizer forms 18.66% and manure 10.47% of the total cost. The other cost items in order of magnitude in variable cost, are power 8.98% (bullock power 4.37% and mechanical power 4.61% interest on working capital 4.35% irrigation cost 3.74%, insecticides pesticides 3.42% and seed 0.97%. The rental value of owned land in the fixed cost farms 11.5 (Rs. 294.99) of the total cost nearly 3/4th of the fixed cost. Likewise wheat, linseed cultivation is also labour intensive on the one hand and greater use of fertilizer and manure on the other shows its commercial character.

Looking to the cost in relation to size of holdings, the distinctive features as revealed by above evidence are :

i) The relationship between the size and cost can be studied in items of the following statistical measure :-

a) $r = -0.29$

b) P.E. 0.275

c) r2 = .0841 or 8.41%

d) K = .9159 or 91.59%

e) The regression equation of x/y is; $x + .004y - 14.0968 = 0$ and the regression equation of y/x is; $y + 20.41x - 2559.922 = 0$ where x is the size and y represents the cost

The value of the coefficient of correlation indicates that the farm size is not related to the cost. Its influence or the degree of determination is only 8.41%. It implies that the cost is being influenced by the factors other than this (size) to the extent of 91.59%. When we look to the two regression equations, we arrive at the same conclusion, i.e.. bearing of the size over the cost is negligible as the regression coefficient of x/y is only .004 while the regression coefficient of y/x is 20.41, implying That the chance

factors play the dominating role in determining the cost.

ii) The relative proportions of variable and fixed cost on different size groups were found to be 83.94% and 16.06% in the case of smallest size i.e.. 0-1 acre group, 79.19 and 20.81% in the case of smallest size i.e. 0-1 acre group, 79.19% and 20.81 in the case of 1-2 acre group. 82.58% and 17.42% in the case of 2-4 acre group, 79.33% and 20.67% in the case of 4-8 acre group and 83.64% and 16.36% in the case of largest size i.e.. 8 and above acre group. This indicates that distribution of total cost among variable and fixed cost into different size groups is almost similar. This however includes following peculiarities- (a) in the case of 0-1 acre group the relative proportion of labour cost is the highest 24.71% which exhibits the capacity of the size group putting the larger units of family labour while in the case of 8 and above acre the relative proportion of fertilizer and manure is the highest (31.74) indicating the greater use of capital in comparison to other size groups. This indicates the commercial picture of the district's agriculture. (b) In the case of 0-1 acre group the fixed cost is the lowest and the variable cost is the highest. This happens to be on account of rental value of owned land per acre being the least (9.83%) and labour cost per acre being the highest (34.71) because of greater crop intensity which brings down the rental value and increases the labour cost. The similar behaviour can be seen by the size group 8 and above acre.

(iii) On the whole the Linseed crop too is found to be labour intensive and secondly the huge quantity of fertilizer and manure is being used by linseed growers which is the characteristic feature of a commercial crop.

iv) The size has no influence on labour cost as indicated by our statistical result, r = 0.57. Also the low positive degree of correlation (+0.17) between size and fertilizer and manure cost shows insignificant relationship i.e.. size does not influence the fertilizer and manure cost. Thus former indicates the better labour

intensity on smaller size and the latter of slightly better investment capacity of the larger farmers.

B) Income of Linseed cultivation

As per the different cost concepts the gross and net income per acre from linseed cultivation were found to be as follows :

The average gross income per acre comes to be Rs. 5672.99 varying from Rs. 6127.69 on smallest farms i.e.. 0-1 acre group to Rs. 4689.34 on 4-8 acre group, being Rs. 5928.04 on 2-4 acre group Rs. 5500.00 on largest farms i.e.. 8 and above acre group and Rs. 5523.93 on 1-2 acre group. The inter group difference in gross income are more visible and magnified in comparison to cost. The evidence is the coefficient of variation which are 100.35 and 9.75 for income and cost respectively. This is due to the difference in produce obtained and disposing it at different prices.

The relationship between size and gross income can better be explained with the help of following statistical measure.

i) $r = -0.41$

ii) P.E. = 0.25

iii) $r2 = .1681$ or 17%

iv) $k = .8319$ or 83%

v) The regression equation of x/y is; $x+.0028y - 18.23864 = 0$ and the regression equation of y/x is; $y + 60.01x - 5265.842 = 0$. Since the coefficient of correlation is less than the six times the probable error it is insignificant i.e., size does not exercise the influence over the cost, further its degree of determination is .1681 or 17% which is not negligible, still the dominating role is being played the chance factors other than the size to the level of 83%. Looking to the two regression equations the same conclusion is drawn as the two regression coefficient viz bxy .0028 and by x 60.1 together reveal the insignificant influence of x (size) upon y (income).

Table No. 6.8

Average Gross income per acre on different size of Holdings as per different cost concepts.

Size Groups	Gross Income Average per acre	Cost Average per acre
0-1 acre	6127.69	2882.61
1-2 acre	5323.93	2348.83
2-4 acre	5928.04	2424.41
4-8 acre	4689.34	2157.48
8 and above	5509.00	2558.12
Sample	5672.99	2559.84

CHAPTER- VII

Returns from Selected Crops

i) Returns from Wheat Cultivation

ii) Returns from Gram Cultivation

iii) Returns from Lentil Cultivation

iv) Returns from Linseed Cultivation

v) Internal Comparisons

Chapter- VII

Returns from Selected Crops

i) Returns from Wheat Cultivation

A) Net Income (Profit) :

Of the four sets of figures relating to net income the first two, presented in columns 4 and 5 in table 7.1 are more meaningful in a study of farm enterprise of farmers economy. Hence attention is focused on these two.

For the sample the average net income, or profit per acre (gross income minus total cost) at 94-95 price level is found to be Rs. 642.19, ranging from Rs. 835.02 on 1-2 acre size group to Rs. 408.22 on 4-8 acre group, and Rs. 641.91 on the smallest farms, Rs. 598.17 on 2-4 acre group; Rs. 558.60 on the largest farms. Eliminating the domestic or family labour cost the overall average comes to Rs. 219.81. This is more significant to self cultivation specially in the situation of small scale family farming. The range of variation is from Rs. 986.27 on 1-2 acre group to Rs. 476.22 on the 4-8 acre size group; and Rs. 882.23 on the smallest farms, Rs. 678.17 on 2-4 acre group and Rs. 569.60 on the largest size group.

The relationship between the size and net income over cost c can be seen or judged thoroughly with the help of following statistical results :

i) $r = -0.52$

ii) P.E. = 0.22

iii) r2 = 0.2704 or 27%

iv) K = 0.7296 or 73%

v) The regression equation of x/y is; x + 13y = 83.2928 the regression equation of y/x is; y + 2.08 x = 617.14.

Table No. 7.1

Average Gross and Net Income (profit) per acre on different size of Holdings, as per different cost concepts.

Size Groups	Gross Income Average per acre (Rs.)	Cost Average per acre (Rs.)	Net income per acre			
			Over cost C	Over cost B	Over Cost A2	Over Cost A1
1	2	3	4	5	6	7
0-1 acre	1550.08	908.17	641.91	882.23	1180.46	1180.46
1-2 acre	1745.00	909.98	835.02	986.27	1335.96	1335.96
2-4 acre	1285.0	686.83	598.17	678.17	973.43	973.43
4-8 acre	1125.0	716.78	408.22	476.22	783.69	783.69
8 & above	1275.0	716.40	558.60	569.60	894.84	894.84
Sample	1493.44	851.25	642.19	819.81	1125.82	1125.82

where x is the size and y represents the net income over cost c.

The relationship between size of holding and net income over cost c is worked out to be insignificant though it can be determined upto the level of 27%. 7 Further the higher value of K (.7296 or 73%) and bxy (.13) still provide the sufficient evidences regarding insignificant behaviour of size over the net income.

These two incomes are negatively associated with the size group i.e.. on larger sizes, the two components of net incomes decrease moderately. The co-efficient of correlation with regard to size are- 0.52 and - 0.8 respectively, the former is insignificant while the latter is significant ie. the size has bearing upon it. Also the coefficient of S.D. are 13.78 and 46.34 together with coefficient of variations 2.26 and 6.45 respectively for the profits over cost C and cost B. This indicates that net income over cost B is more variable than that of over cost C. This is mainly due to wide differences of family labour units employed on different size groups.

B) Input Output Ratio and Profitability Rate :

To scrutinise the overall results in terms of input output ratios and profitability rate further exercise was made, and it brought out the following results :

Column 2 and 3 show the same results, as they should, only the farm and the method of expression is different.

The return on total investment, or the profitability rate, is on the whole 75%. It is the lowest on the 4-8 size group (56%). In the rest of the cases there is no significant differences.

The return on family labour (column 4) shows wide differences, arising out of the extent of domestic and hired labour (wage paid) used in farm operation significantly low

Table No. 7.2

Input Output Ratio and Rate of Profitability from wheat on different size of Holdings at 94-95 price Level

Size Groups	Investment output (Income) Ratio & Indice	Return on Capital (Investment Profit Ratio)	Return on labour		Return on Land
			Family	Total	
1	2	3	4	5	6
0-1 acre	1.71 (171%)	1 : 0.71	2.67	2.62	2.37
1-2 acre	1.92 (192%)	1 : 0.92	5.52	4.31	2.90
2-4 acre	1.87 (187%)	1 : 0.87	7.47	4.12	2.13
4-8 acre	1.56 (156%)	1 : 0.56	6.0	3.42	1.45
8 and above acre	1.78 (178%)	1 : 0.78	55.86	4.12	1.74
Sample	1.75 (175%)	1 : 0.75	3.68	3.13	2.30

figure on the smallest size group and very high figure on the largest (with gradual increase with farm size) are explained by the same phenomenon. The picture is, however, very much different when we look on the return on total labour (column 5). The significantly lowest figure in the case of the smallest farms is explained by the intensity of labour use in farm operation. In the rest of the cases (like the return of capital or total investment) the difference is not marked or significant.

Return on land (column 6), however, brings out an interesting feature. The smallest figure in the case of the 4-8 size group and the highest in the case of the 1-2 acre group are broadly indicative of two things : 1) handicaps of the medium sized farmers, and ii) the effort of the smallest farmers to make the maximum use of the available land under the situation of heavy treasure on land.

ii) Returns from Gram Cultivation :

A) Net Income (Profit) :

From the four set of figures concerning net income the first two, presented in columns 4 and 5 have been considered to be appropriate as they are more meaningful for the study of farm enterprise or farmers economy.

The average net income (or profit) per hectare for the sample as a whole at 94-95 price level, is found to be Rs. 4580.42. It varies from Rs. 6021.39 on 4-8 hectare group to Rs. 3724.34 on largest farms and Rs.4568.52 on 2-4 hectare group, Rs. 4199.38 on 1-2 hectare group and Rs. 4145.97 on the smallest farms. i.e. 0-1 hectare group. The range is wide eliminating the domestic, or family labour cost, the overall average comes to Rs. 4807.68, ranging from Rs. 6148.75 on 4-8 hectare group to Rs 3641.49 on largest group and is Rs. 4741.93 on 2-4 hectare group, Rs. 4458.18 on smallest farms and Rs 4424.64 on 1-2 hectare group. This likewise presents

Table No. 7.3

Average Gross and Net Income (Profit) per acre on different size of Holdings, as per different cost concept :

Size Group	Gross Income Average per acre (Rs.)	Cost Average per acre (Rs.)	Net income per acre			
			Over cost c	Over cost B	Over Cost A2	Over Cost A1
1	2	3	4	5	6	7
0-1 acre	6772.88	2626.91	4145.97	4458.18	4750.20	4750.20
1-2 acre	6915.06	2715.68	4199.38	4424.64	4722.39	4722.39
2-4 acre	7137.27	2568.75	4568.52	4741.93	5127.94	5127.94
4-8 acre	9404.49	3383.10	6021.39	6148.75	6534.29	6534.29
8 and above acre	6390.88	2932.62	3458.26	3641.49	3907.75	3907.75
Sample	7321.20	2740.78	4580.42	4807.68	5134.02	5134.02

a wide range. This feature is indicative of the role of domestic labour in the farm economy of the small and marginal farmer's.

Both these net income measures have a very little degree of relationship with the farm size. In statistical terms it is insignificant; The implication is that these two measures neutralise the influence of size. Some suitable statistical measures are :

i) r^1 = 0.0037 and r^2 = - 0.15

ii) Probable errors for 1st 2nd net income measures are 0.298 and 0.31 respectively.

iii) r^1 = 0.00001369 or 0% and r^2 = 0.0225 or 2%

iv) K^1 = 0.99998631 or 100% and K^2 = 0.9775 or 98%

v) 1 = 791.3 and 2 = 818, and

vi) V^1 = 17.46 and V^2 = 17.48

(Subscripts 1 and 2 have been used for 1st and 2nd net income measures respectively)

The first net income measure appears to be wholly determined by the chance factors, and the second to the extent of 98%. Both the net income measures almost show similar variability over different size of holdings.

B) Input Output Ratio and Profitability Rate :

In the table 7.4 the input output ratio, profitability rate, return on labour and land have been worked out to analyse the overall results.

The column 2 and 3 show the same result as it should be.

The return on capital, or the profitability rate is found to be 1.67 (or 167%) for the sample as a whole. It is the lowest on the largest farms and maximum on 2-4 hectare group. The distinctive feature, which is revealed from the above figures, is that the medium sized farmers are having the maximum returns on capital or making the best use of capital.

The return on family labour (columns 4) shows wide dif-

Table No. 7.4

Input Output Ratio and Rate of Profitability from Gram on different Size of Holdings at 94-95 Price levels

Size Groups	Investment output (Income) Ratio & Indice	Return on Capital (Investment Profit Ratio)	Return on Labour		Return on
			Family	Total	Land
1	2	3	4	5	6
0-1 acre	2.58	1.58	13.27	12.01	16.72
1-2 acre	2.55	1.55	18.64	13.61	16.85
2-1 acre	2.78	1.78	26.34	18.06	13.00
4-8 acre	2.78	1.78	47.28	17.86	16.67
8 and above acre	2.18	1.18	20.22	10.25	14.89
Sample	2.67	1.67	20.15	14.65	15.99

ferences which have arisen because of the extent of wage paid labour (hired) used for Gram cultivation. The very high figure on 4-8 hectare group and very low figure on the smallest farms make the point clear. When we look at the return on total labour, the picture, however, looks different. The low figure on the largest farms explains the low level of intensity of labour use while the high figure on 2-4 hectare group is explained by better labour resource use, Gram graving.

The return on land for the sample as a whole is found to be 15.99. It is the minimum on 2-4 hectare group and the maximum on 1-2 hectare group. These seemingly unusual differences arise out of the varying crop intensity over the different farm sizes. This provides an important clue relating to the peculiar features of the individual production units in agriculture. Every individual unit has its own resource combination, production motivation, other governing factors and thereby decision making. Which impart individual and specific character to it.

iii) Returns from lentil cultivation :

A) Net Income (Profit)

Of the four sets of figures relating to net income the first two, presented in columns 4 and 5 in table 7.5, are more meaningful in a study of farm enterprise or farmer's economy. Hence these two considered to be appropriate.

The overall average net income or profit per acre (over cost c), at 94-95 price level is found to be Rs 4180.56 varying from Rs 5725.57 on the smallest farms to Rs. 2066.38 on the largest farms; being Rs. 4187.18 on 1-2 acre group, Rs. 3463.71 on 2-4 acre group and Rs. 2183.55 on 4-8 acre group. Deducing from it the domestic or family labour cost, the overall average net income comes to be Rs 4684.88 which is more significant to self casual cultivation particularly

Table No. 7.5

Average Gross and Net Income (Profit) per acre different size of Holdings, as per different cost concepts

Size Groups	Gross Income Average per acre (Rs.)	Cost average per acre (Rs.)	Net income per acre Over cost C	Over cost B	Over Cost A2	Over Cost A1
1	2	3	4	5	6	7
0-1 acre	7964.05	2238.48	5725.57	6513.46	6884.36	6884.36
1-2 acre	6015.92	1828.74	4187.18	4651.21	5026.69	5026.69
2-4 acre	5264.61	1800.90	3463.71	3827.64	4244.27	4244.27
4-8 acre	3769.05	1585.50	2183.55	2382.90	2747.60	2747.60
8 and above acre	3707.32	1640.94	2066.38	2341.39	2685.74	2685.74
Sample	6097.04	1916.48	4180.56	4684.88	5056.23	5056.23

in the case of landless farmers who are downtrodden. The range of variation is from Rs. 6513.46 on smallest farms to Rs. 2341.39 on largest farms, and is Rs. 4651.21 on 1-2 acre group, Rs. 3827.24 on 2-4 acre group and Rs. 2382.90 on 4-8 acre group.

Some suitable statistical measures for these two net income measures are.

i) $r^1 = -0.36$ and $r^2 = -0.8$

ii) Probable errors for the first and second net income measures are 0.26 and 0.11 respectively.

iii) $r^1 = .1296$ or 13% and $r^2 = 0.64$ or 64%

iv) $K^1 = .8704$ or 87% and $K^2 = 0.36$ or 36%

v) $1 = 1357$ and $2 = 1558$, and

vi) $V^1 = 38.49$ and $V^2 = 44, 6$

(Subscripts 1 and 2 have been used for 1st and 2nd net income measures respectively)

The farmer's net income measure does not depend upon the farm size while the latter depends upon the farm size as it shows significant relationship. The farm size to these two measures exercise the influence to the extent of 13% and 64% respectively. However, the first net income measure shows comparatively less variability the second as indicated by statistical result. This means, the human labour input seem to be a constant factor.

B) Input Output Ratio and Profitability Rate :

In the table 7.6, to scrutinise the overall results in terms of input ratio and profitability rate further calculations have been made, and it brought out the following results.

Column 2 and 3 show the same result of expression is different.

The return on capital or the profitability rate on the whole is found to be 2.18 (or 218%). It varies from 2.71 (or

Table No. 7.6

Input Output Ratio and Rate of Profitability from Lentil on different Size of Holdings at 94-95 Price Levels

Size Groups	Investment Output (Income) Rates & Indices	Return on capital (Investment Profit Ratio)	Return on Land family	Return on Land Total	Return on Land
1	2	3	4	5	6
0-1 acre	3.56	2.56	7.27	6.67	19.14
1-2 acre	3.29	2.29	9.02	6.87	13.91
2-4 acre	2.92	1.92	9.52	6.12	10.39
4-8 acre	2.38	1.38	10.95	5.94	7.28
8 and above acre	2.26	1.26	7.51	4.08	6.89
Sample	3.18	2.18	8.29	6.47	13.57

271%) on the smallest farms to 1.26 (or 126%) on the largest farms being 2.31 (or 231%) on 1-2 acre group, 1.02 (or 192%) on 2-4 acre group and 1.38 (or 138%) on 4-8 acre group. The distinctive feature, the gradual decrease in the return on capital with the farm size, provides an illustration of the awkward situation of the least inefficient use of capital resource on larger sizes.

The return on family labour (column 4) for the sample as a whole is found to be 8.29. It is the maximum on 4-8 acre group and is the minimum on the smallest farms. The return on the largest farms is nearer to that of the minimum and the return on the remaining two groups is found to be nearer to the maximum. Considering the return on total labour, the picture, however, looks the same except in the case of 4-8 acre group. The low figures on 4-8 and 8 and above acre groups are due to the use of hired labour which is estimated at different wage rates than domestic labour. These figures indicate almost a gradual decrease with the farm size, which is primarily due to the use of wage paid labour.

The return on land (column 6) on the whole is found to be 13.57%. It is the maximum on the smallest farms and the minimum on the largest farms. These figures, however, show a significant, sign of decrease which is an indication of relative effectiveness of land use.

iv) Returns from Linseed Cultivation :

A) Net Income (Profit) :

Among the four sets of figures relating to Net Income in table 7.7 the attention is being focused on first two items of net income i.e. over cost C and over cost B in column 4 and 5 as they are more meaningfull.

For the sample, the profit or average net income per acre at 1994-95 price level comes to be Rs.3113.15 varying from Rs.3503.63 on 2-4 acre farms to Rs. 2531.86 pm 4-8 acre group

Table No. 7.7

Average gross and Net Income (Profit) per acre on different Size of Holdings, as per different Cost Concepts

Size Groups	Gross Income Average per acre (Rs.)	Cost Average per acre (Rs.)	Net Income per acre			
			Over cost C	Over Cost B	Over cost A2	Over Cost A1
1	2	3	4	5	6	7
0-1 acre	6127.69	2882.61	3245.08	3991.07	4327.03	432.03
1-2 acre	5323.93	2348.83	2974.96	3485.60	3857.18	3857.18
2-4 acre	5928.04	2424.41	3503.63	3998.91	4320.93	4320.93
4-8 acre	4689.34	2157.48	2531.86	2911.89	3274.70	3274.70
8 and above acre	5509.00	2558.12	2941.88	3421.88	3704.68	3704.68
Sample	5672.99	2559.84	3113.15	3698.53	4043.33	4043.33

Rs. 2974.96 on 1-2 acre group and Rs. 2941.88 on largest farms ie 8 and above acre group. Deducing domestic or family labour cost ie, net income over cost B, the overall average is found to be Rs. 3698.53 ranging from Rs. 3998.91 on 2-4 acre farms to Rs. 2911.89 on 4-8 acre group; being Rs. 3991.07 on smallest farms RS. 3485.60 on 1-2 acre group and Rs. 3421.88 on largest farms.

To study the relationship between the size and net income the following statistical measure were taken :

i) $r = 0.37$

ii) $PE = 0.26$

iii) $r^2 = .1369$ or 14%

iv) $K = .8631$ or 86%

vi) The regression equation of x/y is; $x + .0039y$ $16.5444 = 0$ and

The regression equation of y/x is; $y + 34.99x - 3186.558 = 0$

Since the coefficient of correlation is less than six times the probable error is insignificant ie, the size is not found to be related to the net income.

However its degree of determination 136 or 14% or degree of non determination. 8631 or 86% speakout that the decisive role is being played by the factors other than the size Also regression coeff.. of x (bxy) which is least in amount (.0039 only) proves further the very little influence of x (size) upon y (net income)

Similarly studying the relationship between size the second net income measure, we notice that this is also negatively associated (coeff of correlation 0.6) The first net income measure shows slowly falling trend while the second decreases moderately on larger size. Also the variation in the second net income measure are more magnified than in the first. This can be seen in forms of statistical measure. viz.

Table No. 7.8

Input -output ratio and Rate of Profitability from Linseed on Different size of Holdings at 94-95 Price Level

Size Groups	Investment Output (Income) Rates & Indices	Return on Capital (Investment Profit Ratio)	Return on Labour Family	Return on Labour Total	Return on Land
1	2	3	4	5	6
0-1 acre	2.13	1.13	4.35	3.24	11.07
1-2 acre	2.27	1.27	5.83	4.29	9.28
2-4 acre	2.45	1.45	7.07	5.06	12.46
4-8 acre	2.17	1.17	6.66	4.35	8.59
8 and above acre	2.15	1.15	6.13	3.98	11.77
Sample	2.22	1.22	5.32	3.87	10.35

The coeff of S.D. and variation for the first are 325.3 and 10.70 respectively while for the second these measures are 405.7 and 11.39 respectively. This is mainly due to the variation in domestic or family labour.

B) Input Out put Ratio and Profitability Rate :

In the foregoing table 7.8 Input. Output Ratio and profitability rate along with returns on labour and land have been calculated. The overall results are found to be as follows :

Column 2 and 3 show the same result. The return on total investment is 122%. It is lowest on smallest farms 113% and highest on 2-4 acre farms (145%). The rest farms show no marked difference.

The return on labour (family as well as total) Table 7.8 shows no marked differences.

However it is maximum on 2-4 acre farms and minimum on smallest farms ie 0-1 acre group This shows the similar pattern of labour use on different size of holdings

"The return on land" is found maximum on 2-4 acre group (12.46) and minimum on 4-8 acre farms (8.59).

The difference has arisen due to the rental value of land. However it should be noted that part of the differences in the different rates of return in the case of different size groups are statistical differences arising out of the sampling design.

V) Internal Comparisons

A) The Frame of References :

The following pages are devoted to assess relative performance of the different enterprises through the composite picture of the data relating to the specific crops, ie., presenting a comparative view regarding cost, income, profit or net income and return in a consolidated form. The selected crops form the core part of the individual farming units and

Table No. 7.9

Cost of Comparisons (Total Cost per acre)

Size of Holding				Wheat			Gram			Lentil			Linseed		
Size Class	Mid Value	Cum. Total	Cum %	Cost per acre Rs.	Cum. Total	Cum. %	Cost per acre Rs.	Cum. Total	Cum. %	Cost per acre Rs.	Cum. Total	Cum. %	Cost per acre Rs.	Cum. Total	Cum. %
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0-1 acre	0.5	0.5	2.4	908.17	908.17	23.06	2626.91	2626.91	18.46	2238.48	2238.48	24.61	2882.61	2882.61	23.30
1-2 acre	1.5	2.0	9.5	909.98	1818.55	46.16	2715.68	5342.59	37.55	1828.74	4067.22	44.72	2348.83	5231.44	42.28
2-4 acre	3.0	5.0	23.8	686.83	2504.98	63.61	2568.75	7911.34	56.60	1800.90	5868.12	64.53	2424.41	7655.85	61.88
4-8 acre	6.0	11.0	52.4	716.78	3221.76	81.82	3383.10	11294.44	79.38	1585.50	7453.62	81.95	5157.48	9813.33	79.32
8 & above	10.0	21.00	100.0	716.40	3938.16	100.00	2932.62	14227.06	1000.00	1640.94	9094.56	100.00	2558.12	12371.45	100.00
Sample				851.25			2740.78		1916.48		2559.84				
Coeff of S.D.,				99.7			295.8		228.9		242.1				
Coeff. of Variation, V				12.66			10.39		12.58		9.78				
Coeff.of Correlation, r				-0.23			+0.63		-0.69		-0.29				
Probable Error, P.E.				0.28			0.18		0.16		0.27				
Coeff. of Determination,r				2.0259			0.3969		.0256		.0841				
				or 5%			or 40%		or 3%		or 84%				
Coeff. of Determination K				.9471			.6031		.9744		.9159				
				or 95%			or 60%		or 97%		or 91.6%				

their production activity. The basic problem is the land-man relationship in its functional state. In this context, the suggestive adjustments cannot wholly be guided by the optimizing theory. This point need special emphasis in the analysis. And an attempt has been made to examine this point.

B) The Logistic of the Argument

It is worthwhile to repeat that each individual crop has its own peculiarity and in commercial agriculture it forms the centrality or the core part of the farmers total farm activity influencing decision- making functions, and the production and the investment patterns. The decision- making functional frame is not the same in the same group. Obviously the criteria of judging things properly is that they should accept the differences, ie. we should not be judging by the idea of equation returns or profits and thereby formulate the cropping pattern form a farm. Operationally it may not be feasible secondly it may not be an appropriate fit in terms of the use of maximum potential, or resource utilisation.

Thus, logically, we may suggest the replacement of one specific crop by another on the basis of the maximum income or return, but what should be the rationale behind it can economic rationale be decisive ? Does it practically fit its in their own activities ? There posses are basic, and this a dimension which needs to be carefully scrutinized. However, some replacement is possible within the given or imagined range, or under certain limits, providing an opportunity for better inputs- use and thereby for accelerating agricultural production.

C) Dichotomy Between Fact and Value :

In a quantified form the cost of cultivation (Rs per acre) is found to be the least (Rs 851.25) in the case of wheat and the highest (Rs 2740.78) in the case of gram. Also the total cost on Lentil cultivation shows greater variabil-

Table No. 7.10

Income Comparison (Gross Income Per acre)

Size of Holdings				Wheat			Gram			Lentil			Linseed		
Size Class	Mid Value	Cum. Total	Cum %	Cost per acre Rs.	Cum. Total	Cum. %	Cost per acre Rs.	Cum. Total	Cum. %	Cost per acre Rs.	Cum. Total	Cum. %	Income per acre Rs.	Cum. Total	Cum. %
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0-1 acre	0.5	0.5	2.4	1550.07	1550.07	22.21	6772.88	6712.88	18.49	7964.05	7964.81	29.81	6127.69	6127.69	22.22
1-2 acre	1.5	2.0	9.5	1745.00	3295.07	47.21	6915.06	13687.94	37.38	6015.92	13979.97	50.14	5323.93	11451.62	41.53
2-4 acre	3.0	5.0	23.8	1285.00	4580.07	65.62	7137.27	20825.21	56.86	5264.61	19244.58	72.02	5928.04	17379.66	63.84
4-8 acre	6.0	11.0	52.4	1125.00	5705.07	81.73	9404.49	30229.70	82.55	3769.05	23013.63	86.13	4689.34	22069.66	80.05
8 & above	10.0	21.0	100.0	1275.00	6930.07	100.00	6390.88	36620.58	100.00	3707.32	26720.95	100.00	5500.00	27569.66	100.00
Sample				1493.44			7321.20			6097.04			5672.99		
Coeff of S.D.,				221.80			1068.00			1580.00			503.50		
Coeff. of Variation, V				15.88			14.78			29.00			100.35		
Coeff.of Correlation, r				-0.18			+0.14			-0.8			-0.41		
Probable Error, P.E.				0.29			0.29			0.11			0.25		
Coeff. of Determination, r^2				0.1324			0.196			0.64			0.1681		
				or 13%			or 2%			or 64%			or 17%		
Coeff. of Determination K				.8676			.9804			.36			.8319		
				or 87%			or 98%			or 36%			or 83%		

ity (12.66) while linseed cultivation shows the smallest degree of variation (9.78) table 7.9.

Looking to gross income per acre (table 7.10) Gram cultivation gives the highest (Rs 7321.20 per acre), and wheat the least (Rs 1493.44 per acre), linseed cultivation shows greater degree of variability (29.6) over different size groups and Gram cultivation the least (14.78).

Going through the table 7.11, the profit or net income per acre is found to be the highest (4580.56 per acre in the case of Gram cultivation and the least (Rs 642.19 per acre) in the case of wheat. The degree of variability is found to be the greatest in the case of Lentil Cultivation and the least (2.26) in the case of wheat cultivation.

When we look finally to the table 7.12, we see that the return on capital in the case of Lentil is 2.18 or 218% (the maximum), and in the case of wheat it is 0.75 or 75% (the minimum). The same result is seen when we look at the input. output rates.

The above facts show :

i) Cultivation (Gram and Lentil) is more profitable when we think in terms of net income taking it as a quantified economic indicator, and (ii) Casual cultivation gives the highest return. From these results we may conclude that the farmers should follow the cultivation of Gram and Lentil or of Linseed and the area under these be increased. Under rigid resource structure it leads to the relative neglect of the cultivation of wheat and Linseed, since they show the poorest return. This argument does net stand the scrutining, because the concepts of equality and stability do not provide the sufficient clue to follow a specific production pattern due to the following situations or conditions of different farms of farmers :

a) All the farmers cannot adopt Lentil cultivation inspite

Table No. 7.11

Profit or Net Income Comparisons (Rs. per acre)

Size of Holding				Wheat			Gram			Lentil			Linseed		
Size Class	Mid Value	Cum. Total	Cum %	Net Income per acre Rs.	Cum. Total	Cum. %	Net Income per acre Rs.	Cum. Total	Cum. %	Net Income per acre Rs.	Cum. Total	Cum. %	Net Income per acre Rs.	Cum. Total	Cum. %
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0-1 acre	0.5	0.5	2.40	641.91	641.91	21.08	4145.97	4145.97	18.29	5725.57	5725.57	32.48	3245.08	3245.08	21.35
1-2 acre	1.5	2.0	9.50	835.02	1476.93	48.54	4199.38	8345.35	36.83	4187.18	9912.75	56.24	2974.96	6220.04	40.93
2-4 acre	3.0	5.0	23.80	598.17	2075.10	68.21	4568.52	12913.87	56.99	3463.71	13376.46	75.89	3503.63	9723.67	63.985
4-8 acre	6.0	11.0	52.80	408.22	2483.32	81.65	6021.39	18935.26	83.56	2183.55	15560.01	88.28	2531.86	12255.53	30.64
8 & above	10.0	21.0	100.00	558.60	3041.92	100.00	3724.34	22659.60	100.00	2066.38	17626.39	100.00	2941.88	15197.41	100.00
Sample				642.19			4580.42			4180.56			3113.15		
Coeff of S.D.,				13.78			791.30			1357.0			325.3		
Coeff. of Variation, V				2.26			17.46			38.49			10.70		
Coeff.of Correlation, r				-0.52			+ 0.01			-0.36			-0.37		
Probable Ennor, P.E.				0.22			0.30			0.26			0.26		
Coeff. of Determination,r				.2704			0.0001			.1296			.1369		
				or 27%			or 0%			or 13%			or 14%		
Coeff. of Determination K				.7296			.9999			.8704			.8631		
				or 73%			or 100%			or 87%			or 86%		

Table No. 7.12

Comparative Returns (Ratio)

Size of Holding	Wheat					Gram					Lentil					Linseed				
	Investment output Ratio	Investment Profit Ratio	Return on Labour Family	Return on Labour Total	Return on land	Investment output Ratio	Investment Profit Ratio	Return on Labour Family	Return on Labour Total	Return on land	Investment output Ratio	Investment Profit Ratio	Return on Labour Family	Return on Labour Total	Return on land	Investment output Ratio	Investment Profit Ratio	Return on Labour Family	Return on Labour Total	Return on land
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
0-1 Hectare	1.71	0.71	2.67	2.62	2.37	2.58	1.58	13.27	12.01	16.72	3.56	2.56	7.27	6.67	19.14	2.13	1.13	4.35	3.24	11.07
1-2 Hectare	1.92	0.92	5.52	4.31	2.90	2.55	1.55	18.64	13.61	16.85	3.29	2.29	9.02	6.87	13.91	2.27	1.27	5.83	4.29	9.26
2-4 Hectare	1.87	0.87	7.47	4.12	2.13	2.78	1.78	26.34	18.06	13.00	2.92	1.92	9.52	6.12	10.39	2.45	1.45	7.07	5.06	12.46
4-8 Hectare	1.56	0.56	6.00	3.42	1.45	2.78	1.78	47.28	17.86	16.67	2.38	1.38	10.95	5.94	7.28	2.17	1.17	6.66	4.35	8.59
8 and above	1.78	0.78	55.86	4.12	1.74	2.18	1.18	20.22	10.25	14.89	2.26	1.26	7.51	4.08	6.89	2.15	1.15	6.13	3.98	11.77
sample	1.75	0.75	3.68	3.12	2.30	2.67	1.67	20.15	14.65	15.99	3.18	2.18	8.29	6.47	13.57	2.22	1.22	5.32	3.87	10.35

of their maximum returns for reasons of the lack of necessary resources both in kind and quality, and the skill in terms of labour.

b) Wheat Cultivation owing to its poorest return, cannot be solely rejected as it is the most suitable crop that is being well adjusted in corporation.

c) Wheat, Gram, Lentil and Linseed crops are of medium duration. Soil and water condition suitable for each are not identical. This fallacy cannot be resolved in absolute terms or by simple straight line methods. Comparisons, therefore pose ticklish issues and need be viewed from this angle.

d) The role of price factor of both inputs and output is also different in the case of different farm enterprises. They differ materially from case to case ie, the different outputs are sold at different times and prices and different farm enterprises incur the different specific inputs. Timings, the sources of supply and the methods of sale and purchase quite often bring about the differences which ultimately reflect in the final results.

Thus, the empirical evidence does not necessarily provide the final criteria for value judgement. This can be taken as a symptom only, or of partly use. Therefore, the most direct and simple conclusions drawn from the facts taken at their face value may be of limited value and likewise of doubtful validity. The suggestive part of the present study has therefore been attempted with this in mind.

CHAPTER- VIII

Role of Dryland Farming in Rural Economy

i) Role of Wheat Crop

ii) Role of Gram Crop

iii) Role of Lentil Crop

iv) Role of Linseed Crop

Chapter- VIII

Role of dryland farming in rural Economy

i) Role of wheat crop :

The magnitude of data presented in the table No-8-1 is indicative only of the degree and extent of wheat cultivation in the total farm enterprise. Besides this economic indicator, the role of wheat cultivation is better understood on looking to the influence it exercises in crop rotations and there by on land resource use, labour utilisation, and in meeting the food needs of farm families during the critical time of the agricultural year, when other food stocks are nil. Thus, this crop plays an important role in the farm economy of this district.

Wheat comes under the Rabi Crop. There are three varieties of wheat (1) Kathia (2) Pisi and (3) Ujra. Kathia and Pisi are sown in the month of October. These crops do not require fertilizer or water. Ujra is sown in the month of November or December: The crop of all of them is ready upto April or May. Kathia is of brown colour. It is very light to digest and good for health.

Wheat is used in many ways. We eat bread, double bread, Sohan Halwa Laddoos, simple Halwa etc. We can say that it fulfils the needs of people.

The by product of wheat is of great use. We get a lot of by product from it. It serves the purpose of food problem of animals otherwise it would have created a lot of problem.

Most part of the land of Banda district is devoid of irrigating means and its agricultural productions are affected by rain. This is why the farmers adopt dry land farming.. They

Table No. 8.1

Proportion of Income from wheat Cultivation to the Annual Total farm Income (from agriculture) :

Size Groups	Total Farm Income Income	Total Enterprise column	%age of 3 to2
0-1 acre	43361.00	6317.00	14.6
1-2 acre	11905.00	3505.00	29.1
2-4 acre	25435.00	3785.00	14.8
4-8 acre	66090.00	5060.00	7.6
8 acres & above	33090.00	4200.00	12.7
Sample	1,79,881.00	22,867.00	12.7

pay attention to such crops which need little water. When it rains in winter season the Rabi crops give better results.

The land under study covered by food grains is 341845 hectare which is 59.91 percent of the total land. In all these crops wheat stands first which covers 190830 hectare of land which is 31.77 percent of total food grains area. The average yield of wheat is much more than other crops.

The farmers all over the country have realised the importance of fertilizers and manures in raising the yields. Their use is mainly dependent on the availability of irrigation water and proper distribution of annual rainfall in the area. It is a commercial rainfall also as it bears low cost and provides good return.

II) Role of Gram Crop :

The data presented in the table 8.2 represents the degree and extent of gram cultivation in total farm economy. The proportion of this farm enterprise in the total farm income works out to be 57.99, which looks very much. Besides, this economic out look, it is the most suitable crop to be better adjusted in crop rotations thereby providing the better use of land resource and intensive use of labour force in its farm operations. To many poor needy farmers it provides livelihood and substantial proportion of income to the medium and large sized farmers. Thus gram cultivation plays dominating role in the farm economy of the district.

Gram is used in many ways people eat its bread or make breads mixing with wheat flour. Besan is prepared. People make pakauree, bhajiya etc. and sweets too are prepared. It is very strength giving foodgrain. It is given to animals also. It is useful to eat in some diseases also.

Gram does not need much water or fertilizer. Farmers generally adopt those crops which have drought resistance character. This crop bears low cost and provides good return.

Table No. 8.2

Proportion of Income from Gram Cultivation to the Annual total farm Income (from agriculture)

Size Groups	Total farm Income Income	Total Enterprise of column	Percentage
1	2	3	4
0-1 acre	52202.00	29860.00	57.20
1-2 acre	54540.00	32330.00	59.28
2-4 acre	80670.00	45740.00	56.70
4-8 acre	81490.00	46000.00	56.45
8 acre & above	42485.00	26650.00	62.72
Sample	311387.00	180580.00	57.99

The agriculture of gram is rainfed. As district Banda is dry and hot to raise the yield per hectare more attention and effort is needed. Application of fertilizers and area under irrigation should be increased. Agricultural inputs like seed of high yielding varieties etc. should be used. Low yield of dry land culture are due to the poor quality of inadequate agricultural inputs untimely field operations inefficient crop production technologies adopted. Such conditions are not good from economic point of view.

III) Role of Lentil Crop :

The data presented in the table no. 8.3 indicates only the degree and extent of Lentil cultivation in the total farm Economy. The proportion of income from Lentil to the annual farm income is 100 percent.

The farmers wholly depend on it for their livelihood. More over, this crop provides work to the agricultural labourers who find no work in summer. Thus, this crop plays an unique role in the farm enonomy of the district, specially to the down trodden people, it is a boon.

The Lentil crop is widely grown in the non-irrigating areas and is very suiting Rabi crop A task of very little expenditure. It bears smaller cost and gives higher returns The most of the part is disposed to the market. It is treated as the special commercial crop of the district.

It is of two varieties- (1) small in size and a little blackish is colour (2) second is a little bigger in size and of brown colour. It is tasty to eat but heavy to digest. The production of Lentil occupies sixth place. Its production is 4.99 percentage of total production. It comes under Rabi crop. It is sown in October and is ripe upto February or March. It does not require water or fertilizer as it is of drought resistance characters.

If proper arrangement of irrigation is made the production

Table No. 8.3

Proportion of Income from Lentil Cultivation to the Annual Total farm Income (from agriculture)

Size group	Total farm Income Income	Total Enterprise Column	%age of 3 to 3
1	2	3	4
0-1 acre	63712.43	63712.43	100.00
1-2 acre	42111.45	42111.45	100.00
2-4 acre	31587.68	31587.68	100.00
4-8 acre	11307.14	11307.14	100.00
8 & above acre	3707.32	3707.32	100.00
Sample	152426.02	152426.02	100.00

will increase a lot. Thus the government will get more revenue which will enable it to do more public works. In this way undeveloped and drought ridden areas become prosperous.

IV) Role Of Linseed Crop :

The magnitude of data presented in the table No. 8.4 represents the degree and extent of linseed cultivation in the total farm enterprise. Besides, the qualified economic indication one can fully understand the role of cultivation on looking to the influence it exercises to the crop rotations and thereby land resources.

Use in labour utilization and in supporting the needs of farm families. More than 1/4th part of total farm enonomy is contributed by this enterprise. Practically the total produce is cashed which helps in meeting the needs of farm families. Thus this enterprise accounts for the significant role in the farm economy of the district.

There are many kinds of oilseeds. On of them is Linseed. It is called cash crop. It is sown with Lentil in the month of October. Water and fertilizer is not necessary for it. The crop of linseed is also of drought resistance character. It is ready with wheat crop. It does not produce much by product like wheat.

As the district is hot and dry so the district adopts dry land forming and more attention is given to growing such crops which need little water. Its crop comes under Rabi crop.

Its oil is very useful for health. People prepare laddoos which relieve them of the pain in waist and back. It is useful for the patients suffering from gout. The roughage of it is eaten by animals. It is very healthy for them.

Table No. 8.4

Proportion of Income from Linseed Cultivation to the Annual total farm Income (from agriculture)

Size groups	Total farm Income Income	Total Enterprise column	%age of 3 to 2
1	2	3	4
0-1 acre	53037.00	17748.00	33.46
1-2 acre	45601.00	20326.00	44.57
2-4 acre	42900.00	8090.00	18.85
4-8 acre	57540.00	17780.00	35.69
8 & above acre	26185.00	1375.00	9.25
sample	225463.00	62019.00	27.51

CHAPTER- IX

The Problems

i) Problems in regard to wheat cultivation

ii) Problems in regard to gram cultivation

iii) Problems in regard to lentil cultivation

iv) Problems in regard to linseed Cultivation

v) Problems in general

Chapter - IX

The Problem

Problem in regard to cultivation

In order to have better production it is necessary to know the disease affecting the crop and also the parts that cause a damage to the stored grain. These are described here under :

I) Problem in wheat cultivation :

A) Dangerous diseases :

The wheat crop suffers from many diseases due to fungus which sometimes cause too much of harm to it. The main diseases are as follows:

1) **Rusts :** Just as iron gets rusted, wheat also suffers from rusts. It can suffer from any one or all three kinds of rusts given here:

   A) Yellow rust or stripe rust

   B) Brown rust or leaf rust

   C) Block rust or stem rust

   Different fungi are responsible for the spreading of above mentioned rusts. Yellow rust is caused by Puccinia

Struformis; Brown rust by P. recondita and Block rust by P.Graminis tritics.

A) Yellow Rust (Harda) :

Symptoms of the disease can be seen in yellow spots on leaves. The disease is mostly found in Punjab, Himachal Pradesh and at times in Bihar. Light Yellow in colour in the initial stage, the spots turn black in the last stage of the disease. In the advanced stage of the disease the spots affect also the stem and the ears. The disease spreads in cold and damp atmosphere.

The disease affected plants hold underweight and hollow grains in them. When the disease reaches the ears, formation of grains stops altogether.

B) Brown Rust :

This disease causes the formation of brown or orange colour spots on the leaves. The spots in the later stage turn black and remain in the scattered position. In the more advanced stage of the disease the stems are also affected by the spots.

The disease is noticed in the last week of December, when the crop is five or six weeks old. The favourable temperature for the disease is between 15°c to 25°c. It is found all over India.

C) Black Rust : The crop sown late suffers from it the most. The disease spreads more in warm and damp atmosphere (20°c to 30°c). Generally it is seen in the first week of March.

It affects the stems and long red brown spots are formed on the stems. In the advanced stage of the disease, the spots are noticed also in the other parts of the plants.

2) **Loose Smut of wheat (Kanduia) :**

The disease is seed borne. When the plant bears the ears, instead of grains there is a black powder formed in them. With the passage of time only rachis is left behind. The powder is borne by air to other ears and when these seeds are sown, the plant again bears these black powder containing ears. Thus, seemingly though the seeds are healthy. Yet in fact they carry the disease forward.

3) **Aternaria Blight :**

This disease is also borne by fungi. The fungi either remain in the seeds or in the remains of the crop. In humid and hot atmosphere when the plants are 1 or 1½ month old, the disease spreads rapidly. It attacks the leaves first and later spreads to whole of the plant. Yellowish brown oval shaped spots are formed. In the advanced stages of the disease, the spots join together; resulting into the whole of the leaf being diseased. Because of the humidity in the atmosphere, black powder is seen on these spots which carries the bacillus of fungi.

4) **Ear Cocle :** The leaves get crimpled in this disease and instead of grains the ears develop more. The ears carry on them some gum like sticky substance on them. Yellowish brown formations can be observed on the ears.

5) **Powdery Mildew :** The disease is caused by Erysiphye graminis fungi. The symptoms can be seen on leaves and ears in the form of white coloured powder. Later the leaves turn yellowish brown and then finally dry up.

6) **Bunt disease :** The bunt is of two types- (a) Karnal bunt, and (b) Hilly bunt.

   a) **Karnal bunt :** This is a fungi borne disease. Some of the ears have their grains turned into black powder. The disease spreads more in humid atmosphere.

   b) **Hilly bunt :** Some inflated faded grains grow within the

ears carrying sticky powder, in this disease. This powder smells like rotten fish.

7) **Flag smut :** The disease is caused by the fungi known as urosystics tritici. Brownish black inflated formations can be noticed on the leaves which later make into black powder carrying germs of the disease that spreads all over the plant. The plant gradually gets dried up. The germs are spread through grains and husk from one place to another. The germs can remian alive in the soil for a long period.

Pests :

1) **Termites :** This is very much harmful and while living under the ground; it feeds itself on the roots of plants.

2) **Stem borer or sesamia inference WLk :** This is one of the chief harmful pests. Its moth lays eggs on the leaves. when the eggs hatch, the caterpillers start eating up the stem.

3) **Wheat Aphid :** It sucks the juices from the grains in the ears and also from the leaves. As a result the plants grow pale and grians grow under weight.

4) **Grasshoppers :** The grasshopper feeds itself on the sprouting seeds and leaves. It is harmful to the crop.

5) **Cut worm or Agrotis Ypsilon :** Its larva cuts the stems of the plants. When it attacks the crop aggressively, it causes too much of loss to it.

6) **Storage grain pests of wheat :** Even the ready crop has to be stored safely. Otherwise these pests can cause upto 50% damage to the stored grain. These pests are as follows :

   1) Rice weevil or sitophilus oryzae.
   2) Grain moth or Rhizopertha dominica.
   3) Khapra or Troguderma granaria.
   4) Red flour beetle or Tribolium castaneum.

II) Problem in Gram Cultivation :

A) Dangerous diseases :

1) Post Root Rottening :

Diseased plants are just like dry grass. The edges of the

leaves of diseased plants become pale and the root turns black and is rotten. This disease continues from the beginning of January upto the end of the crop.

2) **Dried Disease :**

In this disease first of all the leaves below become pale and gradually the whole plant dries up. The stem of the plant becomes brown and if the bark is removed, black strips can be seen. If we tear off the root and stem, we can see dark brown and black strips. This disease can be active at anytime.

3) **Primary Root Rottening :**

In this disease the leaves become pale and the whole plant dries up. The part near earth of diseased stem becomes brown and dies at this place. while fungus can be seen. The period of this disease is mostly from 15, 20 days upto one and half of a month.

4) **Escophita :**

Excepting root the symptoms of the disease are seen on all the parts. In the beginning, small round spots of yellow and brown colour are formed which afterwards take long shape of dark brown colour. The spots increase in size and encircle the branches due to which the diseased plant begins to dry and in the end dies. The disease is more effective at the time of flowering and filling of seed in the plant.

Insects :

1) **Katua Illy :**

Katua Illy hides herself under the pieces of soil in the day time and in the night it rides upon the plants and eats up its delicate branches and leaves and by cutting them drops on the earth. Illy takes its action mostly in the month of October and November.

2) **Majhiya Ghun :**

The adult of this insect eats the seed itself and also cuts the small plants causing them to fall down. Soon the sowing is repeated. The insect remains active in the morning and evening. It being hot in the day time, it hides itself in the spread soil and below the pieces of soil. The insect is more effective in the months of

October and November.

3) The Gram Illy :

After coming out of the egg the Illy first of all eats delicate parts of green leaves and after that the dilicate product of gram that is eaten, becomes empty, turns pale and falls down due to being dry. This insect is most active in October, November and from January to March.

III) Problem in Lentil Cultivation :

A) Dangerous Diseases :

1) Rottening of the root :

The leaves of the affected plant start getting pale and dry up gradually. If we uproot the plant we find that the root is rotten with the cotton like white kawak. This disease is more active in the month of October and November.

2) Uktha Disease :

The leaves of the affected plant start getting pale and the plant fades and dries up gradually. After uprooting the plant grey strips on its roots and stems can be seen. If the stem is cut open, There too, grey strips are found inside it. The havoc of the disease may appear at any time.

3) Mriduromil Disease :

The symptoms of this disease are to be seen first of all in the form of light pale colour spots on the upper part of the leaves. After this just below these spots cotton like fungi is seen which covers the whole leaf by and by. Lastly the whole leaf dries up. The desease is more active in the month of January and February.

4) Bukni disease :

The symptoms of this disease are seen first of all in the form of powder like white small spots on the lower part of the old leaves and afterwards they entirely cover both sides of the leaves. The symptoms of this disease are seen on the peas also when it is in its climex. The disease is most active in January and February.

5) Gerua disease :

The symptoms of this disease are seen first in the forms of

small spots of pale colour on the lower part of the leaves. After some time these spots are changed into the raised brown bursts and after the bursting of the bursts black powder like substance comes out. When the disease is in its extreme the symptoms are seen on the peas of the plant also. The disease is more active towards the end of January and in the beginning of February.

B) Insects :

1) Mahoo :

Both the young ones and the adult suck the juice of delicate stmes, leaves, buds and flowers. As a result of this the growth of the plant stops and the plant remains small in size. Along with sucking the juice, the insects secrete madhushrav too which hinders the process of photo synthesis. The out break of this insect is mostly in January.

2) Phali Bedhak Illy :

The Illy pierces and eats the product inside the pea. As a result of this the pea becomes hollow and dries up. The insect is more active in the month of January and February.

IV) Problem is Linseed Cultivation :

A) Dangerous diseases :

1) Uktha disease :

The leaves of the disease affected plant turn pale and become stiff. After this the whole plant dies gradually. If we uproot the plant we can see that the roots are weak and brown in colour. The disease can be active at any time.

2) Ulterneria leaf spot disease :

In this disease first of all small spots of brown colour are seen on the old leaves. Afterwards these spots accumulate and spread over the entire leaf as a result of this the entire leaf is burnt with heat. The disease is most active in December and Janurary.

3) Gerua disease :

In this disease first of all bright outbursts of orange colour

are formed on both the sides of the leaf. Later on these bursts spread over the entire plant excepting the root. Lastly these bursts turn deep red or brown. In the extreme stage of the disease entire leaf dries up and drops down. This disease is more active from the second fortnight of January upto the month of February.

4) **Bukni disease :**

The symptoms of this disease are seen first of all in white powder like spots on the old leaves and it attacks the entire plant when it out breaks. This disease is more active from the second fortnight of January upto the month of February.

B) **Insects :**

1) **Fly of the bud :**

The Illy of this insect eats the female buds of the flower with the result that the buds do not blossom and get dry. This insect is more active in the month of December and January.

2) **Insect of the leaf Surangak :**

Illy of this insect eats the green part of the leaf making a narrow passage in it. Consequenlty the leaves dry up. This insect is more active in January and February.

Problems in General :

When agriculture, which is a continuous activity in its time dimension, passes through the first distinct stage of development, it is popularly called the transitional period, i.e., change from the old to new system, or from traditional state to the current state which may vary in terms of growth. This is mainly because of the fact of change; which in its basic sense involves dislocation (as distinct from the natural normal process) into the system viz; its institutional (including market structure and credit system), arrangements and the physical nexus. Where the new situations arise the older means do not fulfil the fresh needs and consequently some bottlencks occur, specially relating to tenurial arrangements, seed and insecticides/pesticides supply, marketing and price, credit, crop insurance, technological issues, processing and transport etc, How to meet the new situations, to minimise or solve the farmers

problems is the main criterion of judgement. In other words it means looking into things as to how are they happening; how are farmers facing these challenges in regard to a combined situation of specialisation and commercialisation specially in small scale farming.

In such a changed situation, it seems to be interesting to see the totality in its functional form particularly how the public policy is to be reconciled with individual (farmers) interest, and how both the decision making agencies (planners and administrators at macro level and farmers or farms at micro level) have to think and act in harmony ? The views illustrating the problems of different enterprises based on the common experiences of the farmers in the district as noted during the course of the study are being presented in this chapter.

Problems facing dry farming :

Dry land farming is much handicapped as compared to irrigated farming and assured rainfall farming in the matter of full exploitation of land and other available resources. On dry lands multiple cropping is not possible, the level of fertilizer input is extremely low. Consequently productivity per unit of land labour, power and other capital resources remain low. As a consequence of dependance on nature, scanty, uncertian and insufficient rain, agricultural production and productivity remain low. In other words uncertainty as well as instablity of production and low yields are the hallmarks of dry lands. This obviously is the cause of frequent crops failure on dry farm lands. As a consequence of dependence on nature, the farmers, therefore, try to grow short duration and drought resistant varieties of crops.

Uncertainity is the basic problem and risk which every farmer of the area has to face. The income of the farmers in this dry farming tract is not only small but it also fluctuates widely from year to year. The farmers of the area owing to their insufficient means and resources are seldom able to stand the risk especially when it involves disastrous losses. As a result there is serious decline in farm incomes and consequenlty failures on part of farmers to pay their land revenues and other taxes. As a result of meagre

purchasing power there is decline in the demands of finished goods. They are unable to repay the loans which results in mounting of the debts. Thus the entire community is affected by the acute risk element due to uncertain rains and non availability of assured irrigation of which the farmers are direct and primary victims. Poor crop and its instability is the primary cause of the backwardness of the cattle wealth in the area. Under utilisation of available resources is another important problem of the area. As a result of poor agricultural infrastructure the cropped area and output of Rabi and kharif crops is extremely low. Thus the people of dry farming area are not fully aware of green revolution. Its impact on dry farmed areas is limited. Soil and climatic situation of the dry farmed areas do not permit effective application of nontraditional agricultural inputs and hence people of dry farmed areas are unable to utilise the opportunity provided by green revolution. On the basis of different research findings, concentration on the following will be beneficial for the dry farmed areas as well as for the above explained dry farmed area.

Productivity of land is the function of many inputs such as light, air, quality of soil, seeds, fertilizer, human efforts, agricultural implements and irrigation. But assured irrigation is the precondition for the fuller utilisation of the capacities of other inputs applied in cultivation. The efficiency of other inputs is handicapped by the inadequancy of irrigation. Modern agricultural inputs such as high yielding varieties of seeds, chemical fertilizers are more responsive to irrigation. Crux of the Green Revolution lies in high yielding varieties of seeds and assured water supply. An estimate of the Indian council of Agricultural Reseasrch shows that crop production is about 50 to 100 percent higher in irrigated land in comparison to unirrigated lands in the same locality. Expansion of irrigation facility is necessary because it increases the gross cropped areas. It also helps in raising the yield per unit of land and remove the elements of uncertainty in the agricultural production. In this way irrigation can inject dynamism in agriculture and allied occupations. In other words answer of the problem of dry land farming lies, upto a great extent, in the expansion of irrigation

facilities. In this context there are two important tasks to be performed. Firstly, expansion of irrigation facilities in different parts of the state. Tendency of new projects should be accelerated towards dry land areas and highest priority should be given to the completion of all unfinished irrgation projects. Secondly, there is need of education, intensive programme through demonstration and extension services for water management at farm level.

Soil management includes soil conservation, contour bunding, correction of alcalinity of soil. Soil conservation programme was initiated during the first five year plan period and has been intensified over the successive plan periods. Till 1979-80 an area of 23.40 million hectare was treated by different soil conservation measures. No comprehaensive survey of the extent of area requiring soil conservation and reclamation treatment has been made so far. However, the national commission on Agriculture and the working Group on soil conservation and land Reclamation for the sixth plan have estimated that an area of about 175 million hectares is in need of soil and water conservation measures for preventing degradation and restoration of such degraded lands. Thus according to the available estimates, substantial area of land in the country are affected by soil erosion and land degradation.

Therfore, there is a vast area to be covered. Benefits of soil conservation programme occurred in the shape of development of land and also creation of employment opportunities. Soil conservation on individual holdings cannot be taken up entirely at public cost in view of the magnitude of the problem, especially when the benefits occuring therefrom would go to individual land holders. However, some sort of incentive by way of subsidy or loan is needed to be given to the farmer so as to help him in raising his production and to provide him courage and support so that he may feel enthusiastic in his cultivation efforts and also mentally secured.

The run off or the excess rain water could be stored in small ponds covered by water mats to prevent evaporation and the same could be used for even one life giving irrigation to plants. In general the run off water collected into small ponds can be used in the following situation :

1) Saving of standing kharif crop from drought affect.
2) Providing pre-sowing irrigation for Rabi crop.
3) Extending the growing season for the benefit of long duration crops.
4) Providing a minimal irrigation for growing vegetables, fruits and fodder crops in small areas.

Ratooning is also a form of water harvesting. It means cutting of the crops in such a way as to leave the roots and a lower point of the mainstream in the soil so that when the next rain comes, the plants start growing again. It is observed that most of the rainfall in areas is limited to a short span of rainy season and because of the poor soil structure and under the topography much of it is lost. Hence, steps are necessary for popularisation of modern water harvesting procedures. Development of technological packages involving water harvesting through farm ponds is urgently felt need of the areas.

An important aspect of dry land agriculture improvement is related to the introduction of new high yielding crop varieties. The development of quick yielding crop varieties and photo insensitive varieties have opened new opportunities. New short duration varieties of Arhar, Jwar, Oilseed and cotton are much beneficial in dry farmed areas. But it is very unfortunate that high yielding varieties of Arhar oilseeds and cotton developed so far, are not capable enough to compete the high yielding varieties of wheat and paddy. Breeding of suitable varieties of 'moth' which grows well under semi-arid and arid conditions is necessary. Bulk of cotton crop (about 86 percent) is grown under unirrigated conditions. Research is needed in the group of cotton for introducing early varieties of cotton crops.

New agronomic practices are necessary for mitigating the adverse impact of aberrant weather. Among the new agronomic practices application of nutrients and foilar feedings would be included. Another alternative for imparting stability for arid agriculture is adoption of massive native grasses. These grasses and other fodder crops will help the livestock farming particularly pasture based sheep and cattle raising which is inherently more stable enterprise and have comparative advantage in the arid areas. Crops substitution

will also be helpful to improve the agricultural economy of the area. In this context, choice of capable crops having low water, requirements is necessary.

Development of cottage and village industries is necessary to minimise the extent and intensity of seasonal and disguised unemployment in the area. Dry farmed areas are rich in natural resources, viz. stone, limestone, khair, medical herbs, wood, tobacco leaves and tendu leaves. These natural resources available in arid and semi-arid areas are under utilised. Cottage industries based on these natural resources will be helpful in mitigating rural unemployment.

CHAPTER- X

Remeical Measures

i) Administrative

ii) Social & Political

iii) Technical & Institutional

Chapter- X

Remedial Measures

i) Administrative :

The advent of Independence in 1947 brought about a radical change in Government policy aiming at solving the food problem and rationalising the agricultural economy. Experts like Lord Boyd Orr were invited to study and advise the Government. A number of projects started by the British Government, were later on included in the first Five Year Plan.

According to the constitution of India, which came into force from January 26, 1950, agriculture, by and large, became a state subject. The central responsibility in this area had been rather limited mainly to regulation and development of inter state rivers, fishing beyond territorial waters etc. However, the amendment in 1954, relating to entry 33 in the constitutional Act has considerably widened the scope of action by the centre in agriculture.

The National commission on Agriculture was set up in 1970 "to examine the present conditions and progress of agriculture and rural economy, and to make recommendation for improvement, modernization and the promotion of the welfare and prosperity of the people and to report development of infrastructures including facilities for transport, marketing etc. and suggest lines of future development."

The Ministry of Agriculture was reorganized in 1964 with a "view to making it more effective and enabling it to be more active in matters of implementation of development schemes by the states."

It attempted to assign scientific and technical officers of the ministry executive functions and operational responsibilities for planning, implementation and supervision of programmes in addition to their advisory functions to serve through better administrative machinery. The Department of Agriculture has different wings like- (i) Crop production, (ii) Forests, (iii) Land Reforms, (iv) Inputs and Machinery etc. The specialised offices to look after these are : (i) Indian council of Agricultural Research; (ii) Directorate General of central farm; (iii) Agricultural prices commission; (iv) The Directorate of extension; and (v) Directorate of Economics and statistics.

The central Government undertakes the following functions in the field of agriculture :

a) Coordination of state agricultural plans;
b) Planning of agricultural production targets in collaboration with the planning commission.
c) Provides financial assistance to states for carrying out agricultural plans
d) Ensures timely supply of agricultural inputs (seeds, fertilizers, implements)
e) Provides economic incentives to farmers in the form of support prices and remunerative prices.
f) Provides the services of technical experts to the state Governments.
g) Land reclamation, soil conservation and desert development.
h) Undertakes research in various fields allied to agriculture.

Besides the implementation of the agricultural programmes under the plans, the central ministry also launched the green Revolution schemes and special development programmes for small and marginal farmers, rural unemployment and drought prone areas.

State Agricultural Department :

The functions of the state Agricultural Departments according to the Reserve Bank's publication on "State Aid to Agriculture" sums up the work of the state government in these words- "The measures adopted by the state Government include enactment of laws to control moneylending, to scale down debts and ensure fixity of tenure, starting grow more food schemes and the giving of free grants, loans and subsidies in this connection, distribution of improved seeds, manures and fertilizers on a subsidised basis, providing of irrigation facilities to improve the soil, attempts to grow more fruits and vegetables, efforts to improve the quality of the live stock and so forth."

Actually the main functions of the State Government can be said to comprise of the supervision and control of- i) Agricultural research (ii) Agricultural eduction (iii) demonstration and propaganda (iv) technical improvements, and (v) distribution of improved seeds, manures and fertilisers and implements etc.

Under agricultural education, many schemes have been in operation, to name a few - the establishment and development of agricultural universities, development of agricultural science, improvement of agriculture colleges, establishment of centres of excellence etc. So far as instruction in agriculture is concerned, it is imparted at different levels. In nearly all states agricultural middle schools have been opened to impart practical training in agriculture and the trainees are expected to go back to the land after the completion of their course so as to put their knowledge to practical use. Many Agricultural

universities like the universities of Poona, Pantnagar, Kanpur, Ahmedabad, Hissar, Jabalpur to name some of them, provide advance courses in scientific agriculture. Both theoretical and practical agricultural education in India, is provided by forty five agricultural colleges, which also carry on research on agricultural problems either independently or under the guidance of the I.C.A.R. The research relates to the evolving of better varieties of seed from the point of yield and resistance to disease and drought, better implements and manures etc. Research as a matter of fact forms the back bone of development of agriculture on scientific lines. It is only on account of sustained and systematic research that most of the advanced nations of the world have developed and achieved Agricultural Revolutions. The Royal Commission on Agriculture brought home the importance of research in agriculture as early as 1928. The commission observed that "the basis of all agricultural progress is experiment." Experiences show that the organization which is built up on demonstration and propaganda is, merely a house built on sand. In spite of marked progress which has been made in many directions during the last quarter of the century, it would not be an exaggeration to say that agriculture research in this country is still in its infancy.

In 1945, the Famine Enquiry Commission advocated a certain degree of phasing in the extension of research, instruction and the trainning of research workers. It recommended a system of pilot schemes with the object of demonstrating the results of research and improved farming methods to cultivation. It also emphasised that agriculture should be recognised as one of the most important activities.

That the use of improved varieties of seeds and preparation and use of compost manures and fertilizers were the results of research but lack of a properly trained extension service

had retarded this process, was observed in the first five year plan. It also stressed the role of universities in promoting agricultural research so that they could answer the increased demand for research, and that representatives of progressive cultivators, traders and processors should be associated with the drawing up of annual research programmes. The Report of the Joint Indo-American Team on Agricultural Research and Education 1955, also put a stress on the same points. The Black-Stewart Report 1955, stressed the importance of agro-socio-economic research in the country. Alongwith the Indian Council of Agricultural Research, 9 central Research Institutions and 17 central Commodities committees besides research stations and farms of the state Government, were in existence by this time.

Despite the above mentioned institutions, the Agricultural Administration Committee pointed in 1958 that "the total research underway is inadequate to meet the needs and demands for improved agricultural methods and practices of Indian farms." It also emphasized that "without adequate research extension would be like an empty pipe-line costly alike to the people who paid for it and to the Government that built it." It stressed the need for establishing major research stations for serving the needs of each agro- economic research climate and tract and for having a particular type of soil and for having at least 50 major research stations. It also emphasised the need for a separate section for carrying on technical and research work in the field of agricultural economics.

Again in 1959, the Ford Foundation Team, stressed the importance of research in agricultural economic, especially farm management research that could provide guidance to food production programme.

The Indian Council of Agricultural Research has been reorganised so that a national programme of agricultural research could be developed and administered properly. Another important step was taken by transferring control of all Research Insitituces previously controlled directly by the Ministry of food Agriculture to the reorganised council from April 1966 alongwith the administration control of 8 commodities Research Institutes.

Generally speaking, the ICAR coordinates research work, suggests programmes of research, groups financial assistance for approved schemes and acts as a clearing house for scientific information. It is the national body for coordinating research, education and extension education in the fields of agriculture, animal husbandry and fisheries sciences. The council gives support for the setting up and development of agricultural-university in states. The Department of Agricultural Research and Education in the Union Ministry of Agriculture and Irrigation provides administrative support to the ICAR and co-ordinates the work of central and state agencies.

Set up in 1929, the council was completely reorganised in 1951 to enable it to discharge its responsibilities more effectively, especially in the field of extension work. Steps have also been taken to set up extension service on a national basis to bridge the gulf between the research workers and the farmers. The governing body is now assisted by a Board of Research and a Board of Extension. The council has done useful work in evolving new and disease resistant varieties of crops, especially- wheat, rice, millets, maize, cotton & pulses. Promising results have been obtained in evolving high yielding varieties resistant to parasitic weeds.

Besides specific grants made to ICAR for undertaking certain schemes from time to time, the annual grants made to I.C.A.R. fall under two main heads : (i) an annual government

grant for running the administration which varies from year to year according to requirements, and (ii) payment of the net proceeds of the cess on agricultural produce.

It was decided to plan agriculture and animal husbandry on a regional basis after 1947. According to this decision, research schemes hereafter are classified as fundamental, regional and local. The fundamental items, as far as possible, are allotted to the central institutes, universities and stations such as the central commodities Research station. Regional problems are financed on a contributory basis by ICAR and the state best suited to take up a particular item of research, Local problems are assigned to the respective State Department.

That the results of the researches made in the laboratories have not fully reached the villages and have failed to establish a living and organic link with the field, has been very unfortunate. And it is solely because of this reason that much of good could not be done to the Indian Agriculture on the whole. Had the researches been made utilized, it could have transformed the scene of our agriculture. Unless the "stream of knowledge is duly canalised so as to fertilize the actual fields and farms, its research work is of little value. Divorce between the farm and the laboratory prevents any fruitful use of the results of research. Hence, better and rigorous publicity is needed. Research in the country is being conducted in an isolated fashion and there is little co-ordination. As in our agriculture, so in our agricultural research, 'fragmentation has been the bane."

Another defect is that little attention is being paid to economic aspect of agricultural research. Unless the suggested methods are paying and their application is within the means of the cultivators, the research is of little value and of no avail. A close co-ordination between agricultural research

and economic research is, therefore, very urgently needed. To do this a closer collaboration between the technical experts and economists is required. Also any investigation into food crops must be conducted in consultation with human nutrition experts. Above all "Research should be inspired by a sense of relevance and urgency in view of the serious food situation."

Despite the fact that the Indian experimental stations have been functioning for so many years, it seems very surprising that so little of the work done has found its way into the general body of agricultural science as expounded in the standard treatises. The work, as a matter of fact, has been confined to the laboratories and experiment stations. It has not been brought into living organic relationships to the work being done on the fields by the cultivators. For the advancement of research and the actual efficiency of agricultural production, it is essential that the conclusion arrived at and discoveries made in the various spheres of Indian agriculture should be compiled and made available to the rural areas in a convenient and accessible form. Sir John Russell has very rightly emphasised in this connection- "It should be impressed upon the staff at the experiment stations that they have a responsibility to the cultivator, that they must not shelter within four walls of the laboratory in the hope that, somehow, their work may find practical application : they must make the field and the crop their centres and as early as possible set out experiments on the cultivator's land so as to widen the scope of their enquiry. They should be expected to carry out simplified forms of their experiments on a cultivator's land unless there be good reasons to the contrary."

It should be very clearly understood that no single dose of extension efforts can motorize agricultural growth. It should be a continuous process. An efficient extension machinery must facilitate two way traffic, i.e. the problems of the

farmers must be carried back to the authorities as well as to the laboratories according to the nature of the problem. It shall be important and practically useful to identify the innovating and enlightened type of farmers and to associate the same with the process of extension. This kind of efforts have so far been only neglected in the states. Identifying and encouraging leading farmers to assume leadership in their respective areas is an extension technique which is not only desirable but also a must and it should, therefore, be rigorously pursued.

While coordination in programming and implementation is essential for successful extension work, it is very unfortunate to see that in India the co-operatives, the village panchayats, the N.E.S. Block and the Agricultural Department till recently did not have an integrated approach to agricultural production. The extension personnel like the Agricultural extension officer; the Extension Officer, industries, and the Extension officer, co-operation have divided loyalties as they are drawn from different departments. Agriculture Department, to be to the point, is only one among the many in agricultural programming. Even the Director of Agriculture is not having an important role or final say so far as Extension work is concerned. Such an institutional set up is not very much helpful in the diffusion of technology in any substantial measure.

Farming is a technology involving several factors such as social values, farm management, use of chemicals, machinery etc. The extension work may prove abortive if the farmer is not absorptive Increased education is what can help a lot in spreading farm technology. With regard to agricultural education, the Ford Foundation team has recommended that instead of having the uniformity of agricultural college syllabi, each institution should be encouraged to develop its own programmes based on the geographical area it serves and the problems of

agriculture in the community. In their view, it should be desirable to expand and consolidate those agricultural colleges which are already in existence instead of increasing their number.

As imparting education to the farmers would play a vital role in the betterment of agriculture, intensive publicity of agricultural education should be made in the country side in season and out of season according to a definite programme to educate the people in improved methods of agriculture suitable for the conditions of each area. Brayne, in this connection has very aptly remarked that "well organised publicity greatly increased the amount of work done by each rupee of Government money spent on rural reconstruction. The neglect of publicity is; therefore, a very short sighted economy. Adequate propaganda connotes adequate funds for it is better not to have any propaganda at all rather than a half hearted propaganda." It is also important to note that the personnel involved in the publicity affect its success to a great extent and the success of publicity very largely, if not wholly, depends upon them. "Publicity", according to Brayne, is a technical subject. It is one thing to have a message for the villager; to deliver that message effectively is quite another thing and the technique has to be specially learnt. All, therefore, who are trying to teach the villager new ways and to popularise new things should receive definite training in publicity methods and technique." Other than a full knowledge of the subject of his talk and of the suitability or otherwise of the locality and of the people for the application of the knowledge, the publicity man should also possess a capacity to talk well in the language of the people to be addressed.

As long as steps are not taken to familiarize the common man with the researches, all efforts on administrative level shall prove to be fruitless and it is, therefore, necessary

to adopt all the modern methods of publicity, to name a few- cinema, dramas, songs and dances, models, competitions etc.

ii) Social & Political

1- Socially- Oriented programmes :

The main thrust of any effort to extend the gains of the new technology must be accomplished through the "trickle-down" effects of the economic core of the total investment programme. However, it is unrealistic to expect that the pace of non-agricultural activity contemplated in the fourth five year plan is sufficient to provide enough non-agricultural employment to improve the unemployment situation compounded by the high rates of population increase.

To the extent that general production oriented programmes do not directly extend income gains to all regions or economic groups, explicitly socially oriented programmes must be developed. The welfare aspects of these programmes should be openly acknowledged; political and social costs and benefits should be weighed explicitly along with economic analysis. These programmes should be directed at the dry land areas, the potentially viable small farmers, tenants and rentires, non-viable small farmers and landless labourers. For example, the new small Farmers Development Agency with the specific aim of getting production resources to potentially viable farmers could high pay-offs. Rural works programmes, making use of the labour force in surplus labour areas during the whole year and in all areas during seasonal slack labour periods, could be used for a series of projects which are not easily carried out by individual action or not easily organized for village co-operative action. The public food-grain distribution programmes could be reshaped. Internal migration could be facilitated. Land tenure relationships could be strenghtened.

At the minimum, these programmes may lead to some improvement in income distribution. Also India can possibly "buy time."

until the pace of overall economic development becomes sufficient to provide adequate employment (income creation) as part of its own growth momentum. However, the more optimistic achievement could be more infra-structure building, additional resources generated and possibly some significant impact on the inter personal and inter regional distribution problems.

The policy area, perhaps even more than others, must receive increasingly imaginative conceptual and empirical attention in the near future. The challenge is to design these programmes in such a way that they do add to the production base of the country rather than complete scarce resources away from high pay-off economic investments. Success in these efforts may perhaps even more so than programmes very well determine the ultimate course of Indias political and economic future.

2- Mobilisation of Agricultural population :

It should be done both at the grass root level and the higher levels of decision-making. It relates to the organisation of village level planning and the changing role of village panchayats in the programme of rural prosperity. Besides, to make the farmer's power more effective in matters of agricultural policy decisions, farmers lobbies have to be organised at all levels of decision making and policy formulation, since politics has now become a regular and important part of life. Otherwise farmers interests will remain neglected or unguarded.

3- Decision of Mobilisation on Irrigation Resources :

i) To search out the ground water resources.

ii) Small irrigating channels from the rivers Ken. Yamuna, Bagey and Gunta Nala.

iii) To dig tanks two three in number in every village and store the rain water so that water level may not go down.

iv) The two or three damp on the bank sock or the revined

areas may be established specially in the offset of Bagey and Ken rivers.

v) The closed minor irrigating channals should be started and functionally promoted.

In the above references the politicians should emphasise to introduce the above programme at the district and the provincial level.

The "Bundelkhand Development fund" can be the criterian in this case.

iii) Technical and Institutional :

To maintain and enhance the productive capacity of land and for efficient water use, levelling of plots, reclamation of inferior soils and the improvement of organic soil content many steps have to be taken on technical and institutional fronts. These are described here.

A) Wheat and prevention of its diseases :

1) Rusts :

i) In order to prevent all kinds of Rusts, sowing of Rust preventing varieties like- Arjun, U.P. 301, 319 Sonalika and Girija for hilly areas is more useful.

ii) Sprinkling of Zineb also prevents Black and Brown Rusts, or

iii) Diethane- M-45 medicine .2% diluted in water should be sprinkled. For this purpose it is advised to add 2 kgs. of the medicine in 1000 Lts. of water. Also, .1% Saidowvit should be added to the solution. 1 Ltr of saidovvit added to 1000 Lts. of water is sufficient for the purpose. The solution should be sprayed in the last week of January and the first week of February. 3 or 4 sprays are required at regular intervals of 10-15 days.

iv) As the late sown wheat is more exposed to the danger of suffering from Black or Brown Rusts, wheat must

be sown at an appropriate time. The varieties riping late like P.V. 18 & kalyan sona, should be sown in the first or second week of November.

v) More Nitrogenous fertilizers increase the risks, hence after soil testing phosphorus and Potash should also be used alongwith proper quantities of Nitrogen.

2) Loose smut :

I) The diseased plants should be carefully uprooted and keeping them in bags the same should be buried under the soil.

II) Only standard and certified seeds should be sown.

III) Only disease preventing varieties like PV 18, Kalyan sona should be sown.

IV) The seeds should be soaked in water and exposed to May June sun for properly drying them up before storing them for the next year.

V) The seeds should be treated with .25% Vitavax before storage.

3) Alternaria blight :

I) Disease preventing varieties and certified seeds should be used.

II) Zineb spray controls the disease to a certian extent. While spraying, a small quantity of Urea should be added to it.

4) Ear Cocle :

I) The diseased plants should immediately be uprooted.

II) Certified seeds should be sown.

III) The field should be properly ploughed in the bright sun.

5) Powdery Mildew :

I) 15 to 20 Kg. of sulphur dust per hectare should be spread over the field.

II) Disease preventing seeds should be sown.

6) **Bunt disease :**

I) Certified disease preventing seeds should be sown

II) Vitavax, Agrosun G.N. have been proved useful in preventing of the disease

III) Spraying of zineb is useful.

IV) The plants carrying sumt should be uprooted.

7) **Flag Smut :**

I) Disease preventing varieties should be sown.

II) Certified standard seeds should be sown

III) Proper watering should be ensured.

IV) Crop rotation should be used.

V) 4 Kg. of vitavax per kilo seed should be added.

Controlling of Pests and insects :

1) **Termites :**

5% Aldrin dust or 2% Heptachlore dust or chlordane 5% dust 20 to 30 Kgs. Per hectare should be used in the pits before sowing.

2) **Stem borer or Sesamia inference WLK :**

.04% folidol should be sprayed for its prevention (.455 ml added to 1130 Ltrs. of water.

3) **Wheat aphid :**

.02% folidol (228 ml. added to 113 Ltrs. of water) should be sprayed to treat the crop. BHC dust added to it gives still better results.

4) **Grasshopper :**

BHC 5% dust at the rate of 27.5 Kg. per hectare should be used to control it.

5) **Cut worm or Agrotis :**

Aldrine 5% dust should be used at the rate of 45 Kg. per hectare to treat the soil or Aldrin 5% dust of Heptachlore should be used in the morning to prevent and control it.

6) Storage grain Pests of wheat :

Storage grain Pests like (I) Rice weevil or sitophilus oryzae, (II) Grain moth or phizopertha dominica, (III) Khapra or Trogudarma Granaria, (IV) Red flour Beetle or Tribolium Castaneum can be effectively controlled with the application of EDB. The grain should be stored in a closed room or godown having no ventilation because it releases a gas which ensures safety of the stored grain from all kinds of pests. 30 ml per ton of it is sufficient to serve this purpose. The user should avoid coming in contact with this gas.

Other than this the wheat should be stored by properly drying it up and by ensuring that there is no humidity and dampness in the godown.

The use of Pusabin is good for the purpose of checking the loss done to the stored grain.

To control the rats, a tablet each of 10 gm Aluminium Phosphide should be kept in their respective burrows.

B) Gram and Prevention of its diseases :

1) Escophita :

i) The seed should be purified at the rate of Thiram and karvendajim (2:1) 2.5 gr/Kg. seed.

ii) The crop rotation should be adopted at least for three years.

iii) Dissolving 800 gr. chloride in 200 litre water, the solution should be sprinkled first at the time of blossoming and the next time after 15 days. By doing so the disease will not be effective.

2) Post, Primary Root and Dried Diseases :

Control :

All these diseases are connected with the land and there is no way of checking them if they become

active. Hence if we change the method of agriculture, we can check their intensity.

i) In summer deep ploughing and green manure should be used.

ii) Crop rotation should be adopted and for at least three years oilseed crop should be sown in the affected field.

iii) Resistance pro.seeds should be selected eg-preventive and J.G. 315 which is free from uktha disease.

iv) Before sowing if the seed is purified by thiram and carbandizim (2:1) at the rate 2.5 gr./Kg. seed the effect of primary root rottening is less.

Controlling of Insects :

1) Katua Illy and Majhiya Ghun :

i) In such yields which often become the victim of these insects every year, before sowing one litre Gama B.H.C. or cloropiriphos mixing in 40 kg. sand or 10 G phorate at the rate of 4 kg per acre purifies the land and the effect of insects is reduced a lot.

ii) In the evening heaps of grass should be made at many places so that in the night katua Illys may hide themselves in the grass and these heaps should be burnt afterwards.

iii) By irrigating also the hiding Illys and ghun either die or begin to float on the surface of water and become the victim of birds.

2) The Gram Illy :

i) The resistant varieties eg. P.D.E. 90 2E and G.L. 1014 should be selected and timely sowing should be performed.

ii) If linseed and Mustard seed is sown jointly the effect of the insect is reduced.

iii) If possible, phoroman solution should be used.

iv) In the field after the distance of every three or four meter, small pieces of sticks should be struck so that the birds may sit on it and eat the insects.

v) If one or two Illys are seen after every one metre indosulphan and monocrotophos should be mixed in every 50 ml. or phenbelrate in 200 ml. water, should be sprinkled at the rate of per acre after every 15 days as required.

vi) If water is not available mithil parathian or melathian dust should be spread at the rate of 10kg. per acre.

C) Lentil and prevention of its diseases :

1) Rottening of the root and Uktha :

i) Adopt deep ploughing and long crop rotation.

ii) The rottening of the root is reduced by purifying the seed at the rate of thiram + kobondazin (2:1) 2.5 per kg.

2) Mriduromil :

i) Adopt the crop cycle and destroy the affected part.

ii) The seed should be purified at the rate of 2 gm. Carvendazin per kg.

iii) Seeing the symptoms of the disease 800 gm. oxsochloride per kg. should be desolved in 200 letres of water and this solution should be sprinkled at the rate of 200 letre per acre.

3) Gerua :

The disease affected plant should be uprooted and destroyed in the very first stage of the disease. Just as the symptoms of the disease are seen soluble sulphur 600 gm should be mixed with 200 letre water and sprinkled over the field at the rate of one acre.

Controlling of Insects :

1) Mahoo :

i) In the beginning the affected part should be cut and

destroyed.

ii) On the standing crop anyone of the insect killers based on neem 500 ml. should be dissolved in 200 letre and this solution should be sprinkled at the rate of per acre.

2) Phali Bedhak Illy :

To check the insect it is necessary that any one of the insect killing based on neem 1 letre, Indosulphan 500 ml. and Phanbelrate 200 ml. should be dissolved in 200 letre water and the solution should be sprinkled at the rate of per acre.

D) Linseed and Prevention of its diseases :

1) Uktha :

i) Adopt a long crop rotation.

ii) Deep ploughing during summer reduces its effect.

2) Ulterneria leaf spot :

i) The seed should be purified with Thiram or Carvendazim 2.5 gr./Kg. at the rate of per kg.

ii) Before the outbreak of the disease 600 gr. Olankozeb or 800 gr. copper oxichloride should be mixed with 200 letre water and this solution should be sprinkled at the rate of per acre at the interval of 15 days as need be.

3) Gerua :

i) Selected Neelam breed which is resistant to this disease.

ii) The parasite weeds should be destroyed.

iii) At the time of standing crop it is useful to sprinkle soluble sulphur or 600 gm maknozeb dissolved in 200 letre water at the rate of one acre.

4) Bukni :

i) Take off the parasite weeds and destroy them.

ii) We can save the crop by using the mixture of 600 gm

of soluble sulphur with 200 letre water at the rate of per acre.

Controlling of insects :

1) Fly of the bud :

i) The crop is saved from the insects to a great extent if the seed is sown in the first week of October.

ii) To save the standing crop Demothol 200 ml. or Phasphomidan 100 ml. should be dissolved in 200 letre water and sprinkled at an interval of 15 days as required after the buds are formed.

2) Insect of the leaf Surangak :

The above suggested way controlling the fly of the bird is also effective for this insect.

3) The insect of Rijka :

i) In the field small sticks should be struck at many places so that birds may sit on them and eat up the Illy.

ii) In the beginning 200 ml. water mixed with Indosulfan should be sprinkled at the rate of per acre.

iii) Mithail Parathian or Mailathian should be mixed with 10kg. dust and spread over the field at the rate of one acre. It is very useful.

Crop insurance scheme :

Another measure is that in case of crop loans, if Crops fail due to failure of monsoons or flood etc. or non striking of water in case of loans given for constructing wells, the government should come forward to repay above loans or to bear at least 50 percent of the default. In a country like India where agriculture is still a gamble of the monsoons, one very effective way to encourage rural commercial bank provide increasing finance especially by way of crop finance is to introduce as expeditiously as possible crop insurance scheme in the district.

Sanctioning of Loans to Individual borrowers :

Many difficulties in the implementation of credit schemes arise mainly due to the requirement of several certificates and documents and time consuming procedure for various other formalities. Some efforts are required in the following directions to remove this bottle neck :

a) making land records up-to-date and revenue pass book containing all the details of land- holdings and rights there in, source of irrigation, takavi loans given and other encumbrances are issued to all cultivators.

b) Commercial banks should simplify and standardize their loan applications and documentation formalities with a view to reducing the number of required documents as also to make the 'life' of the documents longer.

c) Branch manager should be given powers to sanction individual loans under approved agricultural schemes. It is also suggested that branch managers should not normally be transferred for a period of 3 to 6 years as sanctioning of loans for agricultural credit schemes requires acquiring of fairly detailed knowledge of the particular rural environment.

Provision of adequate agricultural credit and its delivery are proving to be a major challenge. Cooperative credit went up by a meagre 4.9 percent in 1996-97. The share of priority advances is constant. The crop loan manual must be revised to meet the genuine needs of the farmer in an automatic manner.

Crop loan applications by farmers, applications by voluntary organisations of land levelling, land development or soil conservation and loans for schemes for water development harvesting and improving village tanks should be expeditiously handled. Incentives and

recognition should be given to branch managers of banks who are successful in processing such proposals expeditionsly.

Farmer's training and Education :

In tackling the problems of borrowers, educating the borrowers in the discipline which must be the basic requirement of any institututional credit is absolutely necessary-specially to this area where traditional farming is still going on. It is suggested that in order to enable agriculturists to plan their household economy properly, they should be trained in elementary rural economics, This is the work which the extension service should undertake by holding short courses so that farmers get elementary lesson in rural and agricultural enonomics and also are kept informed of the facilities by way of loans etc. which are being made available to them for rural reconstruction. This work of educating the vast number of agriculturists in household, rural and agricultural economics should be undertaken jointly by the government, Panchayat samiti, schools colleges and banks.

Structural and functional toning up of the Institutional Infrastructure:

Institutions to train man power to provide the servicing facilities for the effective use of new inputs to rationalise the supply of new inputs, for marketing and processing the increased output, to adjust credit with production potentialities and for efficient transportation are basically necessary.

Productivity Criterion for Distribution of Loans :

All development is not necessarily financially intensive and credit based. Yet smooth and easy availability of credit stimulates productive efforts. The most important source of credit viz Co-operative credit societies, suffer from political domination, poor and factional performance and in-efficient management. They are disproportionately biased towards, the rural rich, and a substantial proportion of loanable funds

remains freezed in the form of overdues. In the light of this, hopes seem to lie more with the commercial banks whose net work is now fairly wide and can be extended further. Besides, credit need not necessarily be cheap, but should be easy.

Research to Develop Production Possibilities :

The long term growth in agricultural production requires a research programme continually generating new production techniques and knowledge. The high degree of physical, Economic and cultural diversity in agriculture demands a large quantity of resources and competence in regionally decentralised and adoptative research, specially relating to strains, pest control, soil and water management and communicative methods.

CHAPTER- XI

Conclusion

A) Main findings

B) Main Suggestions

Chapter- XI

Conclusion

A) Main findings :

Apart from social and political imbalances in Uttar Pradesh, Banda district presents a very peculiar picture of agriculture. The situation in this district is mcuh different from other districts of U.P. Inspite of having the hospitality of Yamuna and its helping rivers most of the land of Banda practices dry land farming even in Rabi season. The soil despite being productive, gives poor results. The man power despite being healthy, lives from hand to mouth. It clearly shows the different situations systems and condition of farm economy which are much different from those of common pattern of Indian agriculture and the typical agrarian economy of U.P. In this way we come to know of the new problems it has posed and how the farmers have adjusted there life and farm activity.

The four crops : wheat, gram, lentil and linseed which are highly intensified and localised, to perform foregoing study, were selected. The inquiry relating to these crops covers Two blocks and four villages. The basic unit of inquiry was the farmer (or individual production unit) The size of the sample for all four crops was 100 and 25 cases of growers of each selected crop were taken to conduct the basic inquiry about their farming operation. Apart from an assessment of the background and the historical study based

on the secondary source the empirical part, which forms the major and the core part of the content, is based on the survey method, and relate to full agricultural year.

The chapter includes the substance of the whole study. The outcome of the study has been arranged serially. The findings of the study are as follows :

1. Banda district makes whole within the whole of backwardness not only on economic front but also on the front of education, social disintegration, absence of political awakeness, religious postures and many incapabilities due to poor mental order.
2. The main occupation of the inhabitants of the district is agriculture, about 70% of its population is still engaged in agriculture work. The rest 30 percent of the population lives in urban area.

   The living standard of the rural people is very low because the farmers have no other occupation, except agricultural work, which may increase their income. The daily income of agriculture labourer is supposed to be Rs.25/-
3. In the district, there is economic discripancy, inequality in the distribution of land and lack of modern techniques in agriculture. Besides this, social inequality, untouchability, illiteracy, superstitious belief, blind faith are prevailing in their climax.
4. There is lack of big industries. The percentage of big industries is only 1 percent. There is no development of small and cottage industries with the result, the farmers hence depend on agriculture. After agriculture work, they remain unemployed, that is seasonal unemployment is to be seen.
5. In the district child labour and women labour both are on the top. Women play important role in completing most

of the work connected with agriculture.

6. Like elsewhere in the district about 70 percent people adopt traditional means in agriculture work. Most of them are unaware of the modern techniques. Even if they have the knowledge they are incapable of purchasing them. As most of the area is of dry nature so the people do dry agriculture.

7. The climate and soil of the district are of extreme nature. Extreme climate means that it is extreme cold and extreme hot here. Extreme soil means that the soil found here is much wet and dry, in respect it is very soft and very hard.

8. In the district the area covered under forests in 77781.67 hectare which is 9.96 percent of the total area. Hence it is clear that the covered area is much less. Most of the land is barren and unfertile. If this useless land is developed it can be used for agriculture, animal husbandry, gardens and pastures (meadow)

9. In the production of food grains pulses occupy main place. Among pulses, the largest area is of gram, where as the production of oil seeds and other crops is very low in comparison to the crop of food grains. The total percentage of food grains crops in the district is 56.91 percent and the total percentage of pulses in the district is 36.58 percent and the production of other crops is 6.51 percent. This becomes clear that the farmers are more interested in the production of food grains than the production of commercial crops.

10. On the basis of land holdings the farmers have been divided into five categories :-

    a) Marginal farmers having 0-1 acre of land and

    b) Farmers having 1-2 acre of land

    c) Short farmers having 2-4 acre of land

d) Large medium farmers having 4-10 acre of land
e) Large farmers having over 10 acre of land.

The marginal and short medium farmers are in majority where as large medium and large farmers are less in number. In the district 53 percent farmers are such who have only one acre of land. Large farmers being selfish and lazy by nature, produce food grains and oil seeds only for their consumption and leave rest of the land barren. The marginal and short medium farmers can not use the barren land left by large farmers because They are the owner of it. These farmers are very weak in comparison to large farmers. In this way the barren land is neither used for agriculture nor for gardens, pastures etc. Thus the large farmers exploit the marginal and short farmers Hence their economic condition is very bad.

11. Thus conclusion can be drawn from the present study that the farmers under study are getting ordinary profit from agriculture work. The marginal and short medium farmers have much less land.

    They do not know the use of modern, Techniques of agriculture such as high yielding seeds, timely irrigation, chemical fertilizers, insecticides and pesticides, so their income is low and as a result of this their standard of living too is very low. As the large medium and large farmers use chemical fertilizers, high, yielding seeds, insecticides and pesticides Their income is high. But as regards profit they earn ordinary profit.

12. In Banda district there are two crops in a year- 1) Kharif crop 2) Rabi crop.

    Paddy is the main crop of Kharif. In Rabi crop mainly wheat and gram are produced.

13. The overall results relating to the economy of the selected crops are :

a) The average cost per acre of cultivating wheat on the selected farms comes to Rs. 851.25, average gross income per acre Rs. 1493.44 and the average net income per acre Rs. 642.19%. The input-output ratio, rate of profitability, return on land and return on family labour as well as total labour were found to be 1.75, 0.75, 2.30 and 3.68 and 3.13 respectively. On the whole wheat is found to be a highly labour intensive crop, and secondly, the heavy use of fertilizer and manure is commonly followed by wheat growers. The proportion of income from wheat cultivation to the annual total farm income (farm agriculture) is found to be 12.7%. Wheat forms a good fit in the cropping schedule providing, in addition to cash income, help in meeting the food needs of farm families, when rabi grains are lean or out of stock

B) The cost of cultivation, gross income and net income per acre in the case of gram were found to be Rs. 2740.78, Rs. 7321.20 and Rs. 4580.42 respectively. The input-output ratio. Return on capital and return on land worked out to be 2.67, 1.67 and 15.99 respectively, and the return on labour family as well as total, were found to be 20.15 and 14.65 respectively. Gram cultivation on the whole was found to be fertilizer and manure intensive along with labour intensity. It reveals the characteristic feature of specialized and commercial nature of this crop. The proportion of this farm enterprise into the total annual farm income worked out to be 57.99%, which is more than half. It provides the main source of livelihood specially to medium and small farmers, and plays a dominating role in the total farm economy of the district.

C) The cost of cultivation, gross income and net income

per acre in the case of lentil were found to be Rs. 1916.48, Rs. 6097.04 and Rs. 4180.56 respectively on the selected farms. The input output ratio, return on capital and return on land were found to be 3.18, 2.18 and 13.57 respectively. Lentil cultivation is an example of casual cultivation and is highly labour and fertilizer intensive. The proportion of income from lentil to the annual total farm income in 100 percent. This is because of the landless cultivators, who follow no other cultivation except lentil. It is the only source of income to them.

D) The average cost per acre of cultivating linseed on the selected farms was found to be Rs. 2559.84, average gross income per acre Rs. 5672.99 and the net income per acre Rs. 3113.15. The input-output ratio, rate of profitability, and return on land worked out to be 2.22, 1.22 and 10.35 respectively, while the return on family labour as well as total labour were found to be 5.32 and 3.87 respectively. The linseed crop is also highly intensive. The facts speak of the better labour intensity on smaller size and slightly better investment intensity on the large farms. The degree and extent of linseed cultivation in the total farm economy was found to be 27.51 percent, which is more than 1/4th of the total annual farm income. This is almost wholly market-oriented crop, and is helpful in meeting the other cash needs.

The foregoing study envolves the economic analysis of dryland farming. The human resources are there specially to make the land ready for cultivation and sowing. The selected crops are from the places where dry land farming activities are bestowed.

B) Main Suggestions :

Under these prevailing situations farmers have been managing to adjust themselves, they have been persisting and reshaping agriculture into specialized and commercialized one. Perhaps this is happening only because of farmer's developed psychology. The seeds of development with-in the system itself, as revealed by the historical aspect of the study, seem to be strengthened further in the process of growth, as revealed by the empirical evidence at the later stages of the study. Therefore, looking to the origins of the symptoms, the problems which call for concern appear to be the signs, or indications, of the developing stage of agriculture, which ultimately reveal the situation of 'change'. It leads to conclude that the process of growth in agriculture is both problem solving and problem creating simultaneously.

While thinking of the remedial action it is important to note that we are dealing with the situation relating to the earlier stages of the 'Green revolution, and aiming at stabilizing and enhancing the growth process, briefly termed as modernisation of agriculture. Secondly, agriculture has to be treated as a system, functioning within larger economic system of the region and of the country. Thirdly, development, or modernization, has to be viewed as an overall process. And fourthly, change has to be conceived both in its structural and functional forms. Besides, it is most likely that agriculture in Banda will continue to be, by and large, a small scale enterprise, with the basic feature of land scarcity, operated by peasant proprietors, and the institutional frame is expected to remain democratic in terms of ideological overtones. The suggestions discussed in the text have broadly speaking been made with this back ground in mind. In specific terms and briefly summarized farm they are as follows :

1) Water Management :

An important element in the new strategy for agricultural development is the scientific management of irrigation water and its integrated use with other production inputs and services.

The optimum utilisation of water available from irrigation projects involves study of various factors including soil and climatic conditions and water requirements of various crops at different stages of their growth, in addition to drainage and other needs. It refers to water utilisation and management in areas recently brought under irrigation and can also cover areas newly reclaimed by flood control, drainage and soil conservation measures. It implies planned development of agricultural production in those areas as a composite operation involving adoption of improved agricultural practices, land shaping, construction of channels, supply of inputs and introduction of new cropping patterns.

There is need to spread awareness of critical importance of the conservation and sustainable management of the water resources. It will be appropriate to express yield in terms of units of water consumed, rather than only in terms of land used. On farm management of water and saving and sharing water require much greater attention. The growing damage to the country's biological wealth is another factor that merits immediate attention. The loss of biological diversity at a time when the value of genetic estate has been greatly enhanced by genetic engineering techniques which enable the transfer of genes across sexual barriers, is particularly unfortunate. It will become difficult to overcome the growing problems caused by pests, diseases and weeds as well as soil and climatic stresses if there is no access to a wide range of genetic variability.

2) **Development of Ground Water Resources :**

The high priority given to ground water development in recent years will have to be continued. The farmer has shown that he is willing to pay for reliable supplies of water. In such areas, provision of easier finance through government and co-operative agencies should lead to larger and cheaper supplies of reliable ground water. In areas where such families have not developed and institutional systems act as a constraint, the state will have to play a more direct role in meeting the requirements of small and marginal farmers. The prices of pump sets vary in different parts in the country and effort is required through standardisation and research to upgrade the energy efficiency of pump sets and to bring about uniformity in their prices.

Tank irrigation needs to be revived and strengthened in dry land areas. Studies have shown that the existing minor irrigation tanks are not being properly maintained since community labour for maintenance is no longer available, chiefly because of the increasing commercialisation of the rural economy and the breakdown of community maintenance practices. On the other hand, studies have shown that the return on investment in designing and in improving the operation of tanks is very high because it raised the ground water level in the catchment area and the command area of the tank.

3) **Irrigation for Intensive Cultivation :**

In the development of canal irrigation in the past, one of the main considerations was protection against drought. This meant large coverage with a thin spread of water availability. As a result many of the areas in the command of canal do not get adequate irrigation water supplies for growing two crops. It was felt that through

ground water exploitation specially developing tubewell irrigation in the command of irrigation projects, it should be possible to produce two or more crops in such areas. It has also been suggested that the tempo of exploitation of ground water facilities should be accelerated. Briefly, the new concept of irrigation implies providing adequate water allowance on new irrigation projects in accordance with the optimum requirements of crops, planning and designing of new irrigation projects for higher irrigation intensifies, reducing the command area of state tubewells and encouraging conjugative use of surface and ground water resources. Emphasis was also considered necessary on the development of ground water on compact area basis providing for construction of tubewells, installation of pump sets, land development measures and other complementary inputs in a package from the programme of ground water investigation needs to be intensified for the development of ground water irrigation.

4) **Mechanization of Agriculture :**

The logic and moments of growth have their own weight for a change from the wooden to iron modern technology. New technology, as conceived in its wider connotations, though being more expensive and more variable in pay offs, leads to higher rate of profit, though it proves neutral to size. In addition, technology offers both the opportunities for reducing risks and makes it profitable to follow multiple cropping. Under certain conditions the time interval between the harvesting of one crop and planning for another crop, if production is to be maximised, is so short as to make it necessary to use mechanical power for preparation of the land and sowing, Besides, it is needed for pest control, transport and storage. Therefore, there is a strong pressure for the new technology to be associated

with mechanisation, whether a farmer has the resources to undertake the initial investment for deriving a higher rate of profit, or he is to be supported, or subsidized through public operation the fears of unemployment seem to be exaggerated. The unfolding process of growth must prove employment generating and labour absorptive in the newly created activities.

5) **Establishment of Agro Service Centres :**

The distribution of seeds, fertilizer, farm machinery, tools and equipment should be through these centres. The repairing facilities should also be made available on these centres. At present farmer's organizations being inefficient and costly, trade and industry may serve better. These services are likely to be efficient cheap under competitive situation.

6) **Processing of Small Industries :**

The development of rural cottage and small industries as a means of augmenting, diversifying and dispersing employment in the rural areas should be based on the locally available raw materials. They need not necessarily be conceived as supplementary source of income to farming families as a dual occupation. Industry boards and agencies operating in the area should be functionally co-ordinated in a unified system of different interest groups, operating in such a manner that distinction between agricultural interest and rural industrial activities and interests are harmonized and be mutually stimulating. The poor degree of expansion of industries in the district needs the basic to be taken seriously so as to issue The vast resources of raw-material which is frequently available in the area.

7. **Encouragement to occupational crops along with food grain production :**

The farmer of the district gives top priority to the

production of food grain crops i.e.-gives preference to industries than to occupation. The production of food grain crops is 67.06 percent in the district. Where as oil seeds and other crops are 37.34 percent. Hence the production of oil seeds crop is immaterial in comparison to the production of food grain crops so the government should give suggestion that the farmers should produce only for their consumption. Their aim should be to produce more for occupation than merely for consumption. He can earn more money if he produces these crops, he will get raw material for small and cottage industries. Thus, the villages will develop and the standard of living of its people will be raised. The self employment and hence the prosperity may likely proceed to be boon to the farming community in general.

8. **Price Guarantee and Income Stabilization :**

To maintain farmers, production incentives, sense of security and stability are necessary conditions for growth and modernization of agriculture. Besides, the more important aspect is the stabilization of farm incomes. And, this has to be done through stable prices and public price programmes.

9. **Improvement of the Information and Communication system:**

It assumes growing importance in the process of introducing agricultural innovations. The main channels for communicating agricultural informations, the extension agents, the mass media and the popular local leadership should be made active, effective and up-to-date.

10. **Rural Centering :**

Perhaps the key organizing concept of this whole problem of market development could be an attempt to integrate agricultural development with industrial and commercial activity through new (or remodelled old) strategically

located and comprehensively planned market towns. Convenient location can both increase the marketed surplus and facilitate delivery of supplies to cultivators. Credit facilities and extension information might be added. Dispersion of small scale agro-industries to these market towns would be a means to effectively employ off-season idle labour. The integrated concept of market planning embracing input supplies, production scales. Credit-extension and industrial and commercial activity in one site can be a growth nexus with spread effects which, if strategically planned to promote spatial growth objectives, could trigger a growth multiplier. The close relationship of agricultural progress with urbanization and industrialization is documented in the west. Ludhiana and Coimbatore, although obviously not planned for such a purpose, are private enterprise examples of this process in India already.

The micro approach to market planning might be integrated into the macro policy to attack the broader spatial dimension of agricultural development. Inter regional equity was explicitly stated as a development target. Government programmes which can influence the future regional growth patterns included transportation construction and rate structure, urbanization policy; price support programmes; and investment location for irrigation, storage and output processing. The large number of sugar-crushing and refining mills in north India almost insures that a substantial proportion of sugar will continue to be grown in the north in the future. Future location of starch industries can influence maize location. Oil seed solvent plant placement can influence future soyabean acreage concentration. These policies can be explicitly designed to influence future location of agricultural development.

Alternatively they can be planned to respond to and facilitate the growth patterns that might be expected from

the normal operation of economic forces.

Lastly, a review or a survey of the agrarian scene brings to the forefront a large number of problematic situations which look functionally interconnected. This makes the whole picture highly complicated and intriguing. Customary thinking in this connection has for long been dominated by the idea of vicious circle. The complications characterise the prescriptions with frustrating and disheartening overtones, giving rise to pessimism. The logic of growth, however provides encouragement and hopes. In the light of the existence of seeds of growth within the system, new knowledge and agricultural innovations having been largely adopted by the farmers for good and the multiplier affects of the remedial measures, there are reasonable grounds for hopes for a better future and more prosperous agriculture in the area surveyed in this study.

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APPENDIX

SCHEDULE

A. General Informations

1. Name of Cultivator ____________
2. Name of the Village ____________
3. Tehsil ____________
4. District ____________
5. Police Station ____________
6. Post Office ____________
7. Nearest ____________
8. Hospital ____________

B. Information about Land use

1. Area of Land owned ____________
2. Nature of right (Area) ____________
   i) Bhumidha ____________
   ii) Sirdar ____________
3. Area Operated ____________
4. Area Irrigated ____________
5. Source of Irrigation ____________
6. Cropping Pattern ____________

Kharif		Rabi		Zaid		Remarks
Name of Crop	Area	Name of Crop	Area	Name of Crop	Area	

C. Farm Inventory

ASSETS				LIABILITIES			
ASSETS	VALUE	ASSETS	VALUE	LIABILITIES	VALUE	LIABILITIES	VALUE
1. LIVE STOCK		4. VALUE OF STANDING CROP		1. RENT		4. LOAN TO BE REPAIND	
2. DEAD STOCK		5. FARM BUILDINGS		2. CANAL DUES		5. OTHERS	
3. FARM PRODUCE		7. OTHERS		3. REPAIRS OF BUILDINGS & IMPLEMENTS			
		TOTAL ASSETS				TOTAL LIABILITIES	

in a
litary

<u>EXPENSES OF CULTIVATION</u>

1. Owner of the Plot
2. Name/No. of the Plot
3. Month and year
4. Area
5. Crop 6. Source of Irrigation

Date	Agricultural Operations		Human Labour						Cattle		Other Materials Used			Re-marks
	Particulars	Number	Self & Family	Hired			Exchange	Total	Unit	Rate	Parti-culars	Amount	Rate	
				Perma-nent	Casual									
					Units	Rate								

Cattle : O = Owned, H = Hired, E = Exchange

FARM OUTPUT

Main Product Grain			By-Product Bhusa or Fodder			Total Output			
						Main Product		By Product	
Name of By Product	Quantity	Value	Name of By Product	Quantity	Value	Quantity	Value	Quantity	Value